April 1961

AREA Board of Direction

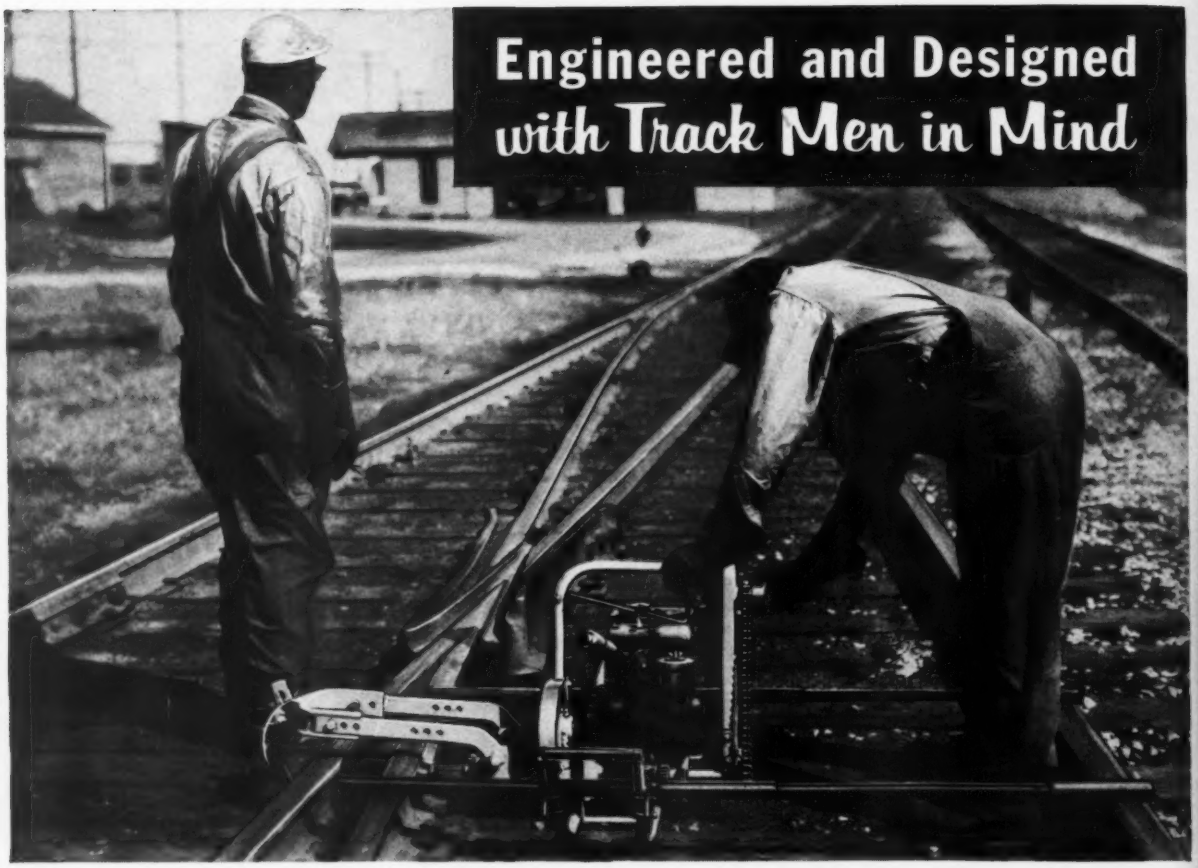
p. 25

Railway TRACK and STRUCTURES

Fast swap for spans in long B&O viaduct

p. 32

A Simmons-Boardman TIME-SAVER Publication



WESTERN FORMERLY BUDA Power Track Drill

Here is a vital piece of equipment in keeping track modernization, expansion and maintenance programs in high gear—the Model P power track drill that has ALL the features essential to economical operation.

EASILY SET UP...and ACCURATE. Can be located from top of rail (with optional telescopic support and locater rods) or positioned on ties and ballast (with long overclutch and adjustable rail guide). No change in set up necessary while working on same size rail.

COMPACT and PORTABLE. Weighs only 130 pounds. Can be started, operated and slid along the rail *by one man.* Easily carried overland by two men.

DEPENDABLE. Gives all-weather, long-life service. Powered by easy-starting 1¾ h.p., 4-cycle Briggs & Stratton air-cooled gas engine. Equipped with Timken roller thrust bearing. Versatile spindle sleeve handles all flat drills from 7/16" to 1 9/16".

SAFE. Can be released and removed from track within 10 seconds . . . no stopping and backing off.

CONTROLLED FEED. Avoids broken and prematurely dulled drills. Sensitive crank-chain mechanism allows operator to vary the thrust accurately according to the hardness of the rail and sharpness of the drill.

FAST. Drills 1⅛" hole in 90 lb. rail in 30 seconds . . . in 155 lb. rail in less than 90 seconds.

HYDUTY-PAULUS MANUAL TRACK DRILL

A track maintainer's tool that every section house should have. Special safety and adjustment features assure precision drilling plus instant emergency detachment.

0803

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WESTERN RAILROAD SUPPLY COMPANY

Division of Western Industries, Inc.

2742 West 36th Place, Chicago 32, Illinois

IN CANADA: Melville Machinery Co., Ltd., 515 Bisson Street, Montreal 3, Quebec

One of a series of ads featuring new WESTERN products formerly supplied by BUDA

You don't bolt this guard to the running rail

The weight of the train on the special depressed flange keeps the Hook-Flange Guard Rail firmly in place.

This is Bethlehem's Hook-Flange Guard Rail, Model 751. It's as rigid and rugged as a guard rail can be, yet one of the easiest of all guard rails to install. No bolt-holes to drill through the running rail, no clamps to bother with.

Because the 751 is furnished as a complete unit, installation is simply a matter of jacking up the rail, slipping the guard rail into place, then spiking it down. The weight of passing trains on the "hook flange" keeps the guard from flinching no matter how hard the lateral thrust.

The tie plates are double-shouldered through the straight guarding area, bearing against the bases of both rails to prevent spreading. Additional strength is provided by thick side braces which are heavily welded in position on the plates.

The Hook-Flange Guard Rail is one of the safest devices of its kind; to our knowledge none has ever broken under traffic. That's saying a lot, because there are thousands of Bethlehem Hook-Flange Guard Rails in service on the country's most heavily traveled roads. A nearby Bethlehem representative will be glad to cover any additional points with you.

Steel for Strength
. . . Economy
. . . Versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

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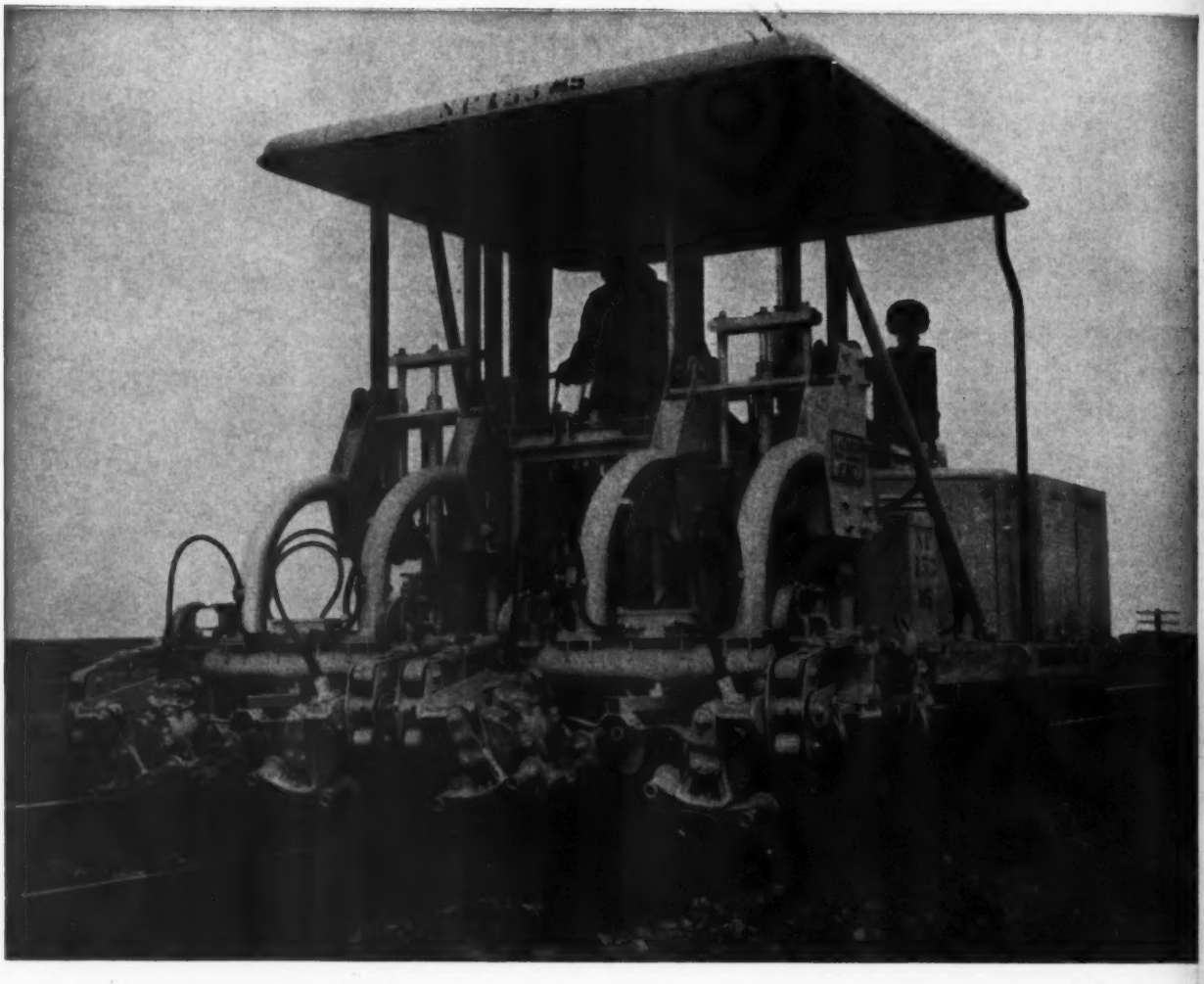
JACKSON TAMPERS



SEE FOR YOURSELF *why*

THE JACKSON TRACK MAINTAINER CONTINUES TO BE THE LONG-ODDS FAVORITE*

why **THE JACKSON PROVIDES THE GREATEST SPEED COMPATIBLE WITH FINEST QUALITY TAMPING**

why **THE JACKSON TRACK MAINTAINER IS THE ONLY TAMPER PERFECTLY ADAPTABLE TO ALL CONDITIONS OF TRACK... conditions of ballast, lowest to highest lifts.**

why **THE JACKSON TRACK MAINTAINER OBTAINS THE LONGEST-LASTING GOOD-RIDING TRACK QUALITIES.**

how **FULL BENEFIT POTENTIALS OF THE MACHINE ARE ASSURED TO EACH USER BY JACKSON'S OUTSTANDING SERVICE ORGANIZATION.**

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***Ever since its inception, the nation's railroads have bought and used more JACKSON TRACK MAINTAINERS than the total of all other machines in their category.**

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LUDINGTON, MICHIGAN

Railway TRACK and STRUCTURES

APRIL

1961 • Vol. 57, No. 4

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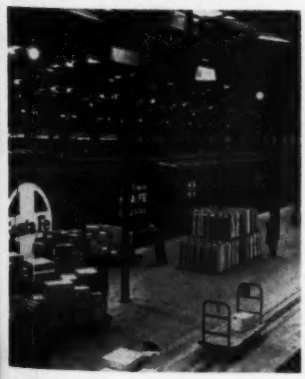

Features

Progress is keynote of AREA convention 25
Five pages of pictures and text give highlights of association's sixtieth annual meeting and the big NRAA exhibit at Chicago last month.

Introducing sand tamping 30
In new method of tamping through turnouts a "shim" of sand is blown under ties by compressed air discharged from special nozzle.

Fast swap for spans in long viaduct 32
Describes how a bridge-erection crew removed three steel spans and a tower and rolled in a long fully assembled span—all in 10 hr.

Big concrete pipe is jacked in place 34
To permit school children to cross its main tracks safely, the NYC installed an 80-in by 80-in precast flat-base pipe with ramp approaches.

Tests give design load for timber piles 36
Summarizes the results of loading tests conducted at Chicago to determine the ultimate capacities and working loads of treated wood piles.

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Don't miss . . .

The Santa Fe recently placed in service at Kansas City its newest rail-truck freight terminal. Main structure is a 1744-ft prefabricated-metal building which can handle 231 trucks and 113 freight cars.

. . . in the May issue

Published monthly by Simmons-Boardman Publishing Corporation, 1309 North Main St., Pontiac, Ill., with editorial and executive offices at 79 West Monroe Street, Chicago 3, Illinois; 30 Church Street, New York 7, New York. Subscription prices: to railroad employees only in the United States and Possessions, and Canada, one year $2.00. Re-entry of second class privileges pending at Pontiac, Ill., with additional second class privileges, Bristol, Conn. Volume 57, No. 4.

Fairmont SPOT TAMPER

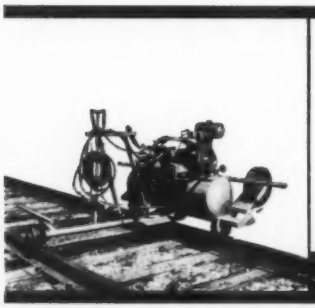
Keeps track maintenance on schedule . . . one man spot-tamps faster than four!

Small labor gangs needn't derail your track resurfacing cycles! A Fairmont W99 Series B Spot Tamper keeps you right on schedule by speeding spot-tamping work. Its single operator (proficient after a few hours' training) can easily spot-tamp faster than 4 men—raise 25 to 30 rail joints an hour. This frees three men of a four-man section gang for other duties.

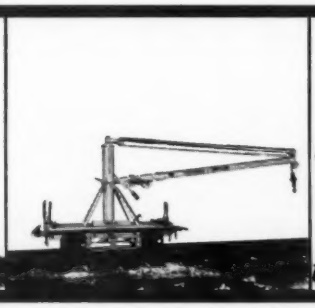
The operator rides in the center of the self-propelled W99 and hydraulically controls all four air tools to raise low spots, hanging ties and old joint locations at an average rate of 30 to 45 seconds per tie-end. The air-actuated guns turn on and off automatically as the tamping head is raised and lowered. The vertical force of a W99 provides good penetration even through hard, cemented ballast. A tilt arrangement for the hinged guns crowds ballast under the ties, while a foot brake prevents creeping. Two-wheel drive adds better mobility.

Available with or without the tamping guns and compressor—and light enough to be transported by truck—the Fairmont W99 can keep your track maintenance on schedule. Send for full details today!

Fairmont equipment is available for lease.



W72 SERIES A OIL SPRAYER. Efficient unit applies oil to rail joints at a cost of just pennies. Compact, portable.



W64 SERIES A DERRICK CAR. Ton-and-a-half limit on 13-foot boom, 360° pivot. One- or two-man operation.

W71 SERIES A TIE SPRAYER. For automatic, one-man, heated protective coating to newly adzed tie surfaces.

Portable turntable and set-off allow th men to remove W99 from the trac

FAIRMONT RAILWAY MOTORS, INCORPORATED
Fairmont, Minnesota

* The Dipper of Disease — the old-fashioned, germ-laden, mouth-to-mouth drinking vessel which spreads infection and sickness. Modern standards of drinking water service prohibit its use.

WHY RISK THE "DIPPER OF DISEASE"?*

Let AJAX WATER SERVICE Help Keep Your Maintenance Budget in Line . . . Promote Better Health and Safety

Here's the easy way to help keep your maintenance costs down. Provide each crew with *portable* AJAX Refreshing Drinking Water Service. It will save time and money by helping them do their jobs more efficiently. Personal service AJAX Cups effectively lower the spread of colds and other infections. Guard health. Help reduce absenteeism.

The AJAX Service provides a generous supply of fresh, cool water right on the spot. Improves morale. Encourages the water consumption good health demands. Reduces fatigue. Eliminates time-consuming walks. Increases worker efficiency. Imprinted, AJAX Cups promote safety. And they end "the dipper problem" forever.

You'll be surprised at how much the *portable* AJAX Water Service can help your maintenance budget. Write for cup samples and details.

HOW AJAX SERVICE HELPS ONE RAILROAD SAVE

Reports from one large road indicate that it enjoyed worthwhile savings in its maintenance budget after it adopted the complete AJAX Water Service. One big advantage is the fact that the standard installation fits right onto the track maintainer itself. Always ready; always at hand.

The AJAX Water Cooler is a heavy duty, 5-gallon unit. It is easy to sterilize and keep clean. Well insulated to keep water cool. The AJAX Cup Dispenser can be mounted on the cooler or attached separately to the track maintainer. It holds 300 AJAX Cups in the 4- or 6-oz. size. AJAX is the cup that dispenses open, ready to use. Available plain or imprinted with safety messages.

If you are looking for a way to increase worker efficiency and still keep your budget in line, look into AJAX.

AJAX® CUPS

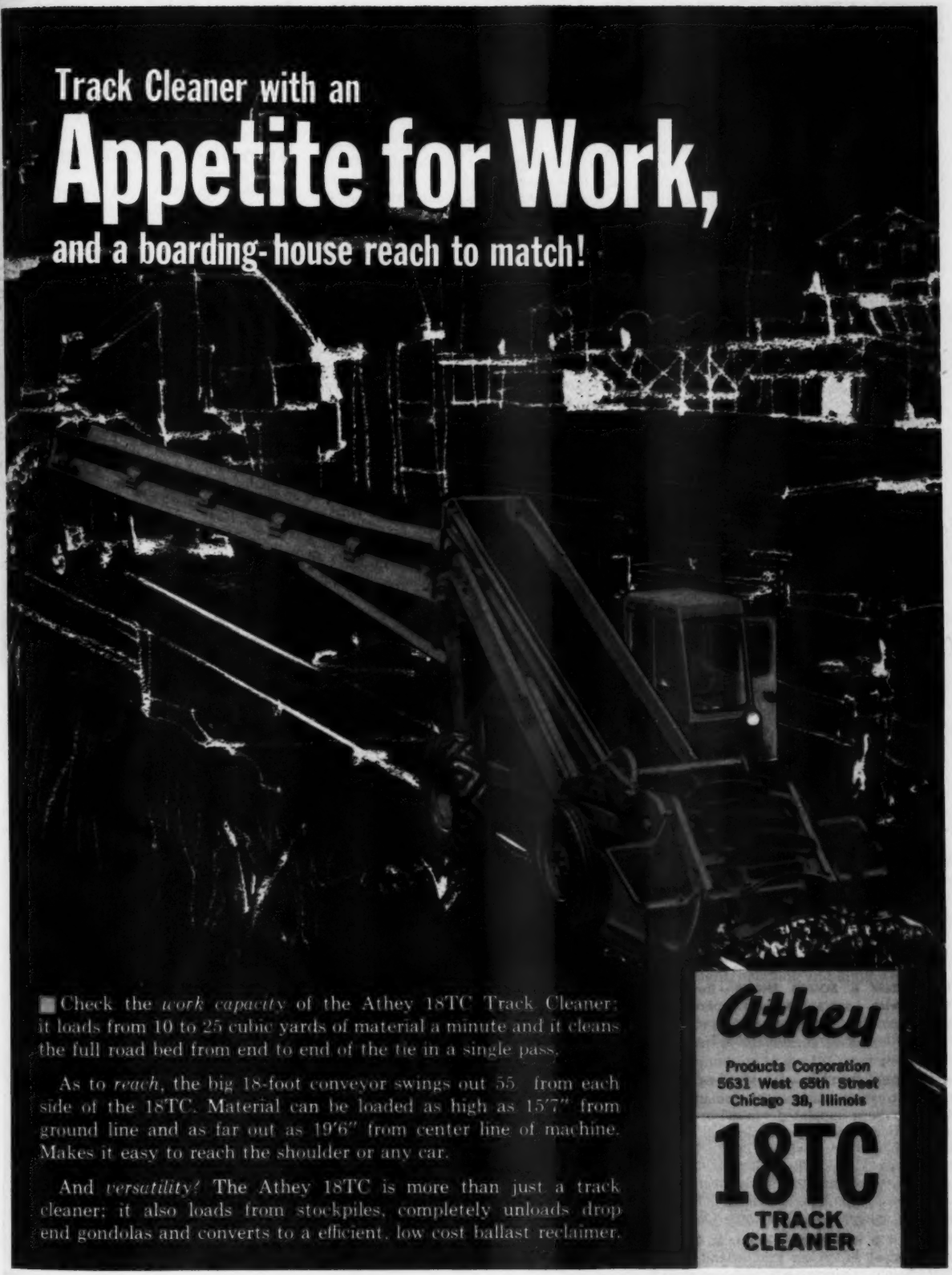
UNITED STATES ENVELOPE COMPANY

WORCESTER 5, MASS. • DALLAS 20, TEX.
EMERYVILLE 8, CALIF. • DORAVILLE, GA. • INDIANAPOLIS 6, IND.

Track Cleaner with an

Appetite for Work,

and a boarding-house reach to match!



■ Check the *work capacity* of the Athey 18TC Track Cleaner: it loads from 10 to 25 cubic yards of material a minute and it cleans the full road bed from end to end of the tie in a single pass.

As to *reach*, the big 18-foot conveyor swings out 55 from each side of the 18TC. Material can be loaded as high as 15'7" from ground line and as far out as 19'6" from center line of machine. Makes it easy to reach the shoulder or any car.

And *versatility!* The Athey 18TC is more than just a track cleaner; it also loads from stockpiles, completely unloads drop end gondolas and converts to a efficient, low cost ballast reclaimer.

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5631 West 65th Street
Chicago 38, Illinois

18TC
TRACK CLEANER

TRACK CLEANING FACTS . . . Get the full story, send for informative literature on the Athey 18TC Track Cleaner.

YOU SAW IT AT THE NRAA EXHIBIT . . . Athey Ballast Reclaimer Conversion Kit. Fits all Athey Track Cleaners . . . reclaims ballast for half new ballast cost.

NEWS ABOUT PEOPLE

CANADIAN NATIONAL — The following appointments on the Prairie Region have been made as the result of the reorganization of this company's territorial setup:

D. B. McKillop, engineer at Port Arthur, Ont., to area engineer, Lakehead Area, at Port Arthur; **H. E. Amos,** engineer at Winnipeg, Man., to area engineer, Winnipeg Area, at Winnipeg; **F. J. Farish,** engineer at Winnipeg, to area engineer, Assiniboine Area, at Winnipeg; **J. J. Pomor,** engineer at Dauphin, Man., to area engineer, Hudson Bay Area, at The Pas, Man.; and **J. A. Nayler,** engineer at Saskatoon, Sask., to area engineer, Saskatchewan Area, at Saskatoon.

E. S. English has been appointed regional engineer, Mountain Region, with headquarters at Edmonton, Alta. **V. R. Cox,** project engineer (access line) at Toronto, Ont., has been promoted to location engineer, system, at Montreal, Que.

CANADIAN PACIFIC — **J. H. Creighton,** bridge and building master at Toronto, Ont., has been transferred to Smiths Falls, Ont., succeeding **E. N. Morin** who retired recently after 43 years of service.

CHICAGO & NORTH WESTERN — **L. Bevilaqua,** assistant roadmaster at Boone, Iowa, has been promoted to roadmaster at Wall Lake, Iowa, succeeding **R. J. Christensen,** who has been appointed assistant engineer at St. Paul, Minn.

DENVER & RIO GRANDE WESTERN — **B. W Molis,** superintendent signals and communications at Denver, Colo., has been promoted to assistant chief engineer there. **Mike Vodopich** has been appointed track supervisor at Price, Utah, succeeding **Robert E. Davis** who has been transferred to Delta, Colo. Mr. Davis succeeds **R. L. Colwell** who has been transferred to Dotsero, Colo., succeeding **Arthur F. Baker,** whose promotion to assistant roadmaster at Durango, Colo., was announced in the March issue. **B. L. Warren,** track supervisor at Helper, Utah, has been transferred to Salida, Colo.

NEWBURGH & SOUTH SHORE — **Raymond G. Wintrich,** assistant general superintendent, Cleveland, Ohio, has been promoted to assistant general superintendent-engineering.

NEW YORK CENTRAL — **W. H. McLaughlin,** timber treating engineer at Indianapolis, Ind., has been appointed supervisor bridges and buildings at Englewood, Ill. **M. A. Motter** has been appointed bridge inspector at Cleveland, Ohio.

J. G. Pfaller, assistant division engineer at Toledo, Ohio, has been promoted to division engineer at Columbus, Ohio.

NORFOLK & WESTERN — **Charles B. Gibson, Jr.,** assistant supervisor bridges and buildings, Scioto division, has been promoted to assistant yardmaster at St. Paul, Va.

SOUTHERN — **David V. Messman,** engineer of bridges at Knoxville, Tenn., has been promoted to assistant to chief engineer, with headquarters at Washington, D. C. Mr. Messman has been succeeded by **James P. Allen,** assistant engineer of bridges at Knoxville.

J. M. DeWine, assistant supervisor at Somerset, Ky., has been promoted to track supervisor at Winston-Salem, N. C. **James W. Simpson,** track supervisor at Dalton, Ga., has been transferred to Hickory, N. C. **Eugene D. Miller** and **Douglas R. Webb,** track supervisors at Selma, Ala., and Charlotte, N. C., respectively, have been promoted to assistant trainmasters at Danville, Ky., and Columbia, S. C., respectively. **Frank M. Amick** and **Luke M. Hyberger,** assistant track supervisors at Union, S. C., and Atlanta, Ga., respectively, retired recently, after 42 and 45 years of service.

SOUTHERN PACIFIC — **Hobert Kent** has been appointed roadmaster at Wells, Nev., succeeding **W. D. Flanary** who has been transferred to Klamath Falls, Ore. Mr. Flanary succeeds **Virgil Winkelman** who has retired after 45 years of service. **Gordon L. Brummett,** roadmaster at Deming, N. M., has been transferred to Coos Bay, Ore. **Sidney A. Strong** has been appointed assistant supervisor automotive and work equipment at Portland, Ore.

Biographical briefs

Vernon R. Copp, 60, who was recently promoted to principal engineer of the Frisco at Springfield, Mo. (*RT&S*, Oct., p. 10), was born at Floyd, Iowa. He entered the service of the Frisco in 1922 as a chainman, subsequently being promoted to rodman, instrumentman and accounting engineer. Mr. Copp was further promoted to assistant division engineer in January 1945, chief maintenance clerk in August of that year, senior assistant engineer in 1946 and resident engineer in 1947. He was advanced to construction engineer in June 1953 and special engineer, design and construction, five months later. Mr. Copp was serving in the latter capacity at the time of his recent promotion.

Frank J. Fico, 42, who was recently promoted to senior engineer on the Baltimore & Ohio at Baltimore, Md. (*RT&S*, Oct., p. 10), was born at New York and graduated from Johns Hopkins University in 1944 with a Bachelor of Science degree. Mr. Fico entered the service of the B&O in 1947. Two years later he was appointed inspector at Baltimore. He was promoted to field engineer at Curtis Bay, Md., in 1951, project engineer at Brooklyn, Md., in 1952, and resident engineer at New York in 1957. Mr. Fico was further promoted to terminal engineer at Locust Point, Md., in 1958, the position he held at the time of his recent promotion to the position of senior engineer.

Supply trade news

CHIPMAN CHEMICAL COMPANY — **John M. Marsh** has been appointed district representative for railroad sales in the Pacific Northwest.

KOEHRING COMPANY — **The Southern Equipment & Tractor Co., Inc.,** with offices at Monroe, La., New Orleans, Shreveport and Baton Rouge, has been appointed a distributor of Koehring products for Louisiana and adjoining counties in Arkansas, according to a recent announcement. The announcement also states that the **Brown-Fogle Equipment Company,** Houston, Tex., a subsidiary of Southern Equipment & Tractor, has been appointed a distributor for southeastern Texas.

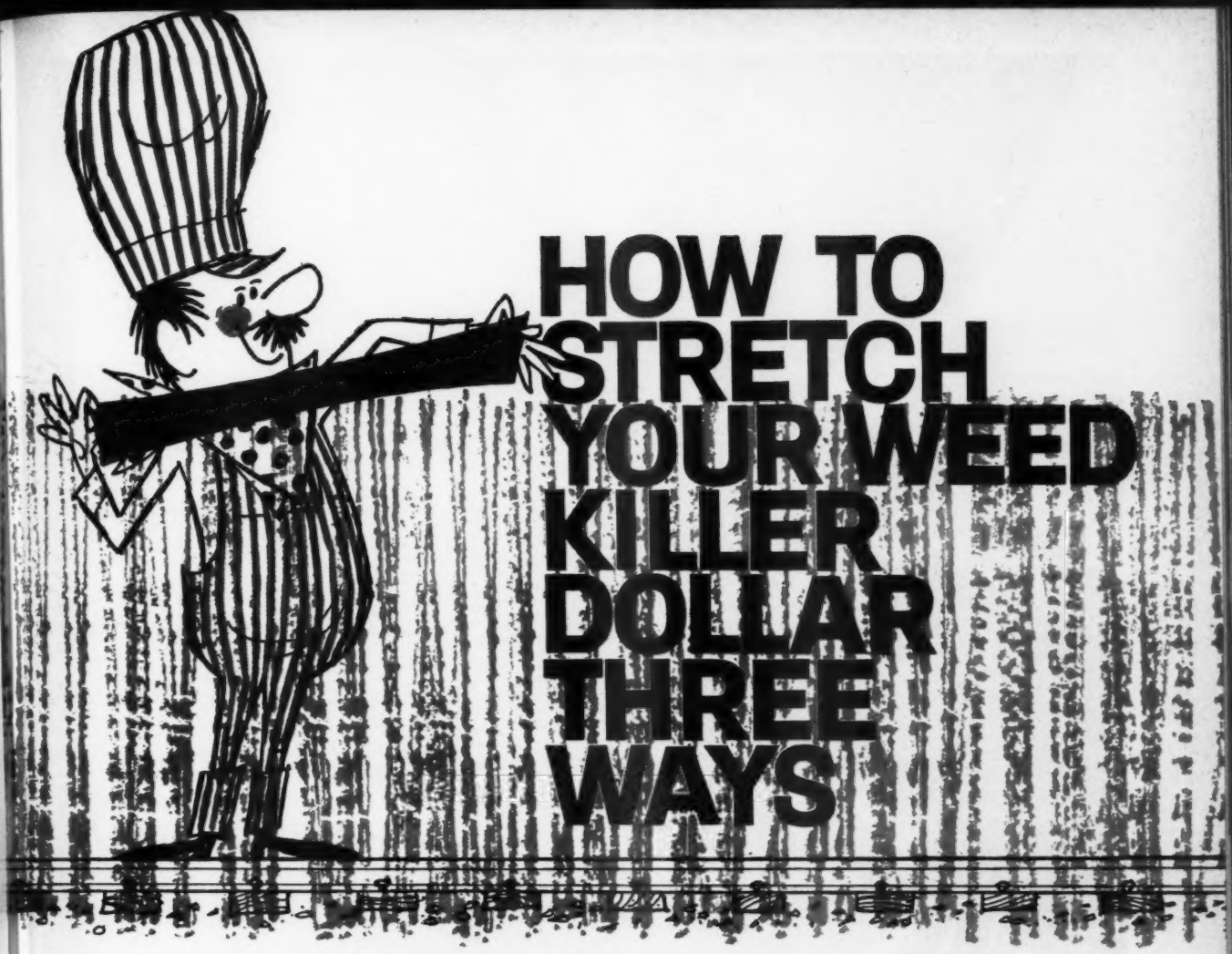
Both companies will sell and service products manufactured by the Koehring, C. S. Johnson, Parsons and Buffalo-Springfield Divisions of Koehring Company, including crane-excavators, off-road hauling units, batching plants, clamshell and concrete buckets, construction mixers, ladder and wheel-type trenchers and rolling and compaction equipment. Southern Equipment & Tractor currently is a distributor for Buffalo-Springfield products.

MATISA EQUIPMENT CORPORATION — **Thomas Y. Gehr** has been appointed general sales manager of the Matisa Equipment Corporation and Matisa Railweld, Inc., with headquarters at the firm's general offices at 1020 Washington Ave., Chicago Heights, Ill. In his new capacity Mr. Gehr will be responsible for sales and promotion of track equipment and contract services to railroads in the United States and Canada. He formerly was manager of the Track Equipment Division, of Pullman-Standard, with headquarters at Hammond, Ind.

Thomas Y. Gehr

PLASSER RAILWAY MAINTENANCE CORPORATION — This company has established a new plant at 700 20th Street, Rockford, Ill., according to a recent announcement. The company states that it is now ready to deliver its track maintenance machines from the new location and that it has also opened a warehouse there for stocking replacement parts. **Emmerich E. Wechselberger** has been named plant and service manager with offices at the new address.

SPRAY PRODUCTS CORPORATION — **The J. Paul Saunders Company,** Bowling Green, Ky., has been appointed representative of Spray Products in Kentucky, Tennessee, Mississippi and Alabama, according to an announcement by **Miles Powell,** vice president in charge of sales.



HOW TO STRETCH YOUR WEED KILLER DOLLAR THREE WAYS

NEW PRODUCTS

SERVICE

EQUIPMENT

UREABOR® 31—New granular combination of 3 proven weed killers for dry application. Kills a greater variety of weeds, more effectively than any other herbicide on the market. One application keeps weeds down for a whole season. Effective control, plus low application rate and ease of application really stretch your weed killer dollar.

UREABOR 62—New High Concentration granular weed killer is chemically the same as UREABOR 31—only double strength—especially designed for the large volume user. Stretches your weed killer dollar even more as you save on freight, handling and application costs.

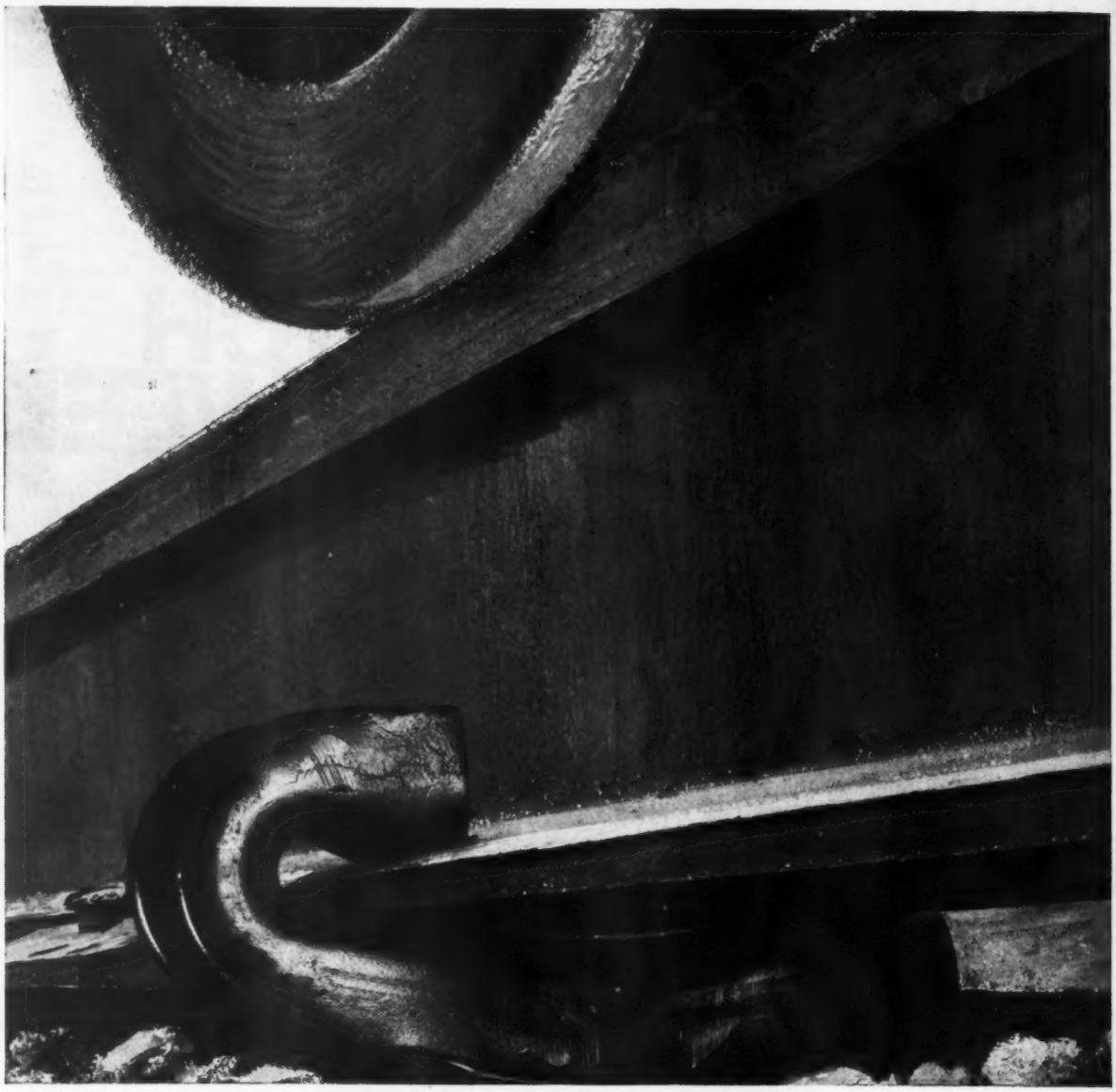
Only U. S. Borax offers the services of 23 experienced field men—who know your local weed, soil and weather conditions. They are available now to advise and *show you how* to get the most stretch from every dollar in your weed killer budget.

From yards and switches to rights of way and bridges, U. S. Borax can recommend a choice of weed killer spreaders from hand operated PCB Spreaders to power driven equipment to give you the most economical herbicide application possible. This equipment is specifically developed to stretch your weed killer dollar by applying U. S. Borax weed killers most economically in every situation.

Want to learn more about stretching your weed killer dollar? Write today for complete information.

U.S.BORAX

630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA



MASSIVE STRENGTH

CHANNELOC rail anchors pack a lot of metal—*working* metal.

This massive, one-piece anchor is forged from a solid bar of tempered steel. Its U-channel provides rugged double-flange support for greatest holding power. It has thorough and even heat treating. Plenty of reserve gripping power for reapplication. And you can install the CHANNELOC with sledge, maul or machine.

True Temper will be glad to help you see that anchors are properly applied. Contact True Temper, Railway Appliance Division, 1623 Euclid Avenue, Cleveland 15, Ohio.

TRUE TEMPER®

CHANNELOC RAIL ANCHOR

Railway TRACK and STRUCTURES

NEWS NOTES

. . . a résumé of current events throughout the railroad world

Net income of Class 1 railroads in 1960 is now officially estimated at $445 million, compared with 1959's $578 million and 1958's $603 million. Rate of return last year averaged 2.13 per cent. Twenty-seven Class 1 roads failed to earn their fixed charges in 1960.

The railroads' share of the national income continues to decline. The ICC's Bureau of Transport Economics & Statistics calculates that gross revenues in 1959 amounted to only 2.6 per cent of the national income, down from 1958's 2.7 per cent. This was less than half the industry's 1939 share, which was 5.7 per cent. It compares with domestic airlines' 0.5 per cent of the national income in 1959 and truckers' 1.8 per cent.

Big trucks will pay a larger share of highway costs if Congress adopts President Kennedy's recommendations for financing the federal highway program by user payments. The President would increase the annual license fees and the taxes on diesel fuel and tires because studies show that improved highways benefit the operators of big trucks "many times as much as the average automobile driver." Immediate reaction of the truck operators and Teamsters union was that the increases would force many truckers out of business. Close observers feel Congress will adopt the recommendations on a compromise basis.

The Teamsters have stepped up their campaign against railroad piggyback operations, with a shift of emphasis from job loss to tax loss. Federal, state and local governments and "taxpayers lose when railroads pirate trucking industry," a union pamphlet proclaims. Teamster-inspired, anti-piggyback letters are pouring into Congress, and in at least two states the legislatures already are studying measures which would place special taxes on piggyback operations.

Guaranteed rates or contract rates have been condemned by the ICC as "unjust and unreasonable" because they "constitute a destructive competitive practice within the meaning of the national transportation policy." The ICC ordered the NYC to cancel the guaranteed rate it maintained for shipments of rugs and carpets between Amsterdam, N.Y., and Chicago. Two dissenting commissioners protested that the ICC, having called on the railroads to overhaul their rates, should now permit "experimentation within legal limits."

Detailed monthly reports of policies and actions of the ICC and six other regulatory agencies have been requested by the White House. These reports, covering actions taken during the preceding month and pending for the immediate futute, will be read by both President Kennedy and by James M. Landis, whose duties include the supervision of the regulatory agencies.

Rate-making freedom contemplated by the 1958 Transportation Act would be severely restricted by Senate Bill 1197, sponsored by five members of the Interstate Commerce Committee. The bill would emasculate Section 15a(3), the rate-freedom section, by adding provisions stipulating that ICC consideration of competitive rates must include consideration of the effect of the proposed rates on the earnings of carriers proposing them, the competitive necessity for the rates, the effect "upon a lawful rate structure," and the tendency "to cast an unjust burden upon other traffic."

Dow helps you save half the cost of vegetation control

Cut the high cost of controlling vegetation along right-of-ways with Dow chemical weed and brush killers. Dow will help you plan a vegetation control program tailored to your needs which will keep signals and switches, ballast and berm continually free from grass, weeds and brush.

With planned chemical weed control many firms save over half the expense of hit-or-miss manual methods. Compared to the time and labor involved in hand-cutting and mowing which offer at best only temporary control, a chemical program actually decreases in cost year by year, while its application becomes easier.

Dow tailor-makes chemicals for every vegetation problem. *Ballast and berm:* Low-cost Radapon® kills grasses, tops and roots; Kuron® or 2-4 Dow® Weed Killer, Formula 40® controls broad-leaf weeds. For longer residual control, these products may be used in combination with soil-sterilant type products.

General Weed Control: Kuron, 2-4 Dow Weed Killer, Formula 40, Esteron Ten-Ten®.

Brush Control: Veon® 245, Esteron® 245 O.S., Kuron.

Signals, switches, yards and bridges: Baron® or Garlon® for both broad-leaf weeds and grasses.

Dow provides both chemicals and planning to help you control vegetation most economically. For full information on this service, write THE DOW CHEMICAL COMPANY, Agricultural Chemicals Sales Dept., Abbott Road Building, Midland, Michigan.

Cost of manual vegetation control stays high year after year

Cost of chemical control decreases each year

THE DOW CHEMICAL COMPANY DOW Midland, Michigan

Cutting a 94-inch swath of heavy brush in a single pass.

One-man brush disposal crew!

Just one man and an IH tractor equipped with heavy duty International Danco rotary mower provides big-scale brush control at pleasingly low cost. Heavy whirling blades shred heaviest growths —even saplings up to four inches in diameter—for a total kill down to ground level.

Level-lift control linkage automatically keeps the mower level as the operator changes cutting height on the go. Optional 10-speed Torque Amplifier drive permits the operator to match operating speed to mowing conditions . . . reduce speed one-third, *on-the-go*, in any gear, without shifting. Superior mowing ability combines with built-in stamina to insure many seasons of day-in and day-out performance. Four tractor and mower sizes, 58 to 94-inch cutting widths.

Center-mounting mower lowers the tractor's center of gravity to permit safe mowing on slide slopes as steep as 2:1. Shredded vegetation forms a mulch which helps choke new weed growth and retards water run-off, checking berm erosion.

For dealer's name and International Danco catalog, write International Harvester Co., Dept. RTS-4, P.O. Box 7333, Chicago 80, Illinois.

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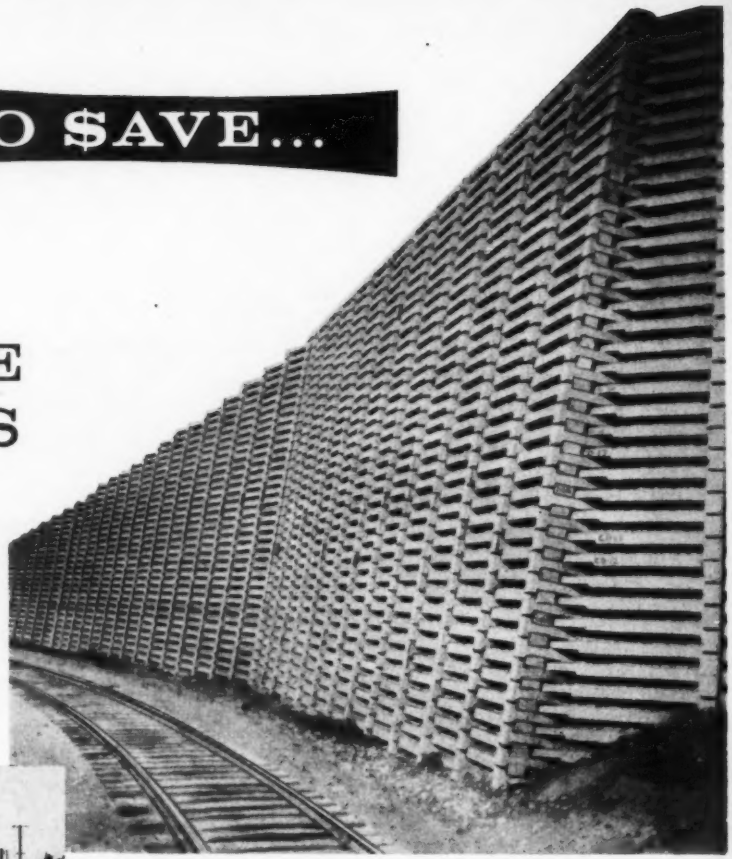

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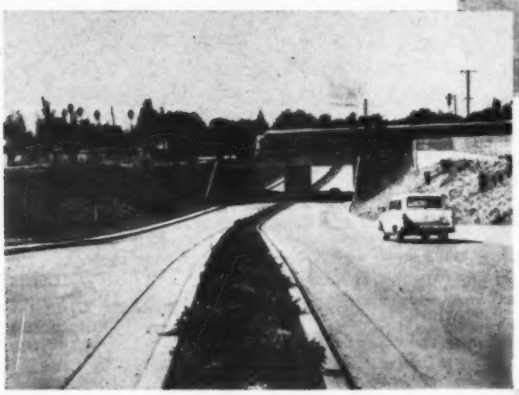
Concrete crib walls, because of their economy and adaptability, are the permanent answer to most retaining wall problems. Architecturally pleasing too.



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Precast maintenance-free Amdek bridge beams are made under factory controlled conditions, delivered on schedule, erected quickly with minimum traffic tie-up.

CULVERT PIPE

Concrete culvert pipe is permanent. Available in the shape, size and strength required. Has superior hydraulic properties.

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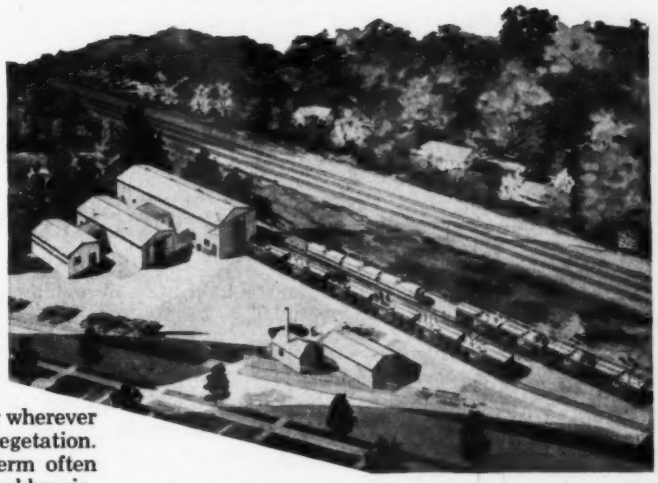
Pre-Emergence Weed Control That Lasts All Year Long

Nalco® H-174® Granular Weed Killer Gives Excellent Control At Low Dosages



This maintenance center keeps Nalco's modern spraying and spreading equipment in tiptop condition for precision application of weed and brush control chemicals. It is one more reason a Nalco program is the most effective way to attack any weed or brush control problem.

Weed control by pre-emergence applications of formulated organic herbicides ... *in dry, granular form* ... originated with Nalco. And Nalco's constantly improved soil residual type weed killers still do the job best—in yards, around fences, bridges, and buildings—or wherever you need an area kept clean and free of vegetation. "Broad spectrum" weed control is a term often used to describe H-174 ... a convenient abbreviation for the fact that it provides a long lasting kill of virtually any type of grass or weed!

Clean, Weed-Free Areas

Pre-emergence treatment with Nalco H-174 kills seedlings when they sprout, prevents the trashy appearance and fire hazard of a stand of dead and dried out weeds. And it saves the labor of cleaning up after weed killer treatment. That's why, although you can apply it any time, the best time to put down Nalco H-174 is just before the weeds come up. Anti-leaching characteristics of the hard, granular formulation assure a residual effect that helps prevent regrowth for a full season ... and sometimes beyond, thus lowering dosage requirements in succeeding years.

Low Dosage = Less Labor, Storage

Nalco H-174 contains a powerful active ingredient, made even more effective by using it in this *dry* carefully-sized granule form. The small granules drop right to the soil, attack vulnerable seedlings or roots. You do a thorough job with less chemical because H-174 delivers *more* killing power at the *best* killing spot. And working with a smaller volume of chemical greatly simplifies application—saves storage space, transportation costs and labor!

NEW self-propelled spreaders for Nalco H-174 weed killer speed up application in yards and other areas.

Now Is the Time for Action

Early-season action on weed control with Nalco H-174 gives you year-long protection, and extra fair-weather time for other maintenance work. Your Nalco Representative will be glad to help you get a prompt start. Call him, or write to Nalco for help with any weed or brush control problem.

Chemicals and Services to Fit All Your Needs

How should you approach a weed control problem? Look for a program. Choose the source that will give you a vegetation survey and pre-season planning; offers a wide selection of weed and brush killers (almost any you can name!) for any soil, climatic and vegetation condition; includes efficient spreading and spraying equipment; has trained personnel to supervise application; and provides post-season evaluation reports. Only Nalco makes it all available in a package that will deliver best possible weed control for the budget you command.

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OPINION

The industry at stake

Piggyback operations especially the hauling of new cars, appears to be the most promising item in the railroad industry's traffic portfolio. Yet, this business is already threatened with extinction by the Teamsters union.

Through negotiations of new contracts, carried out late last year with some trucking companies, a charge of $5 for the Teamsters' welfare fund may be exacted starting next February 1 for every trailer unit shipped by piggyback.

The Teamsters' publication has advised its members to write their congressmen and senators "describing exactly how the unfair piggyback rates awarded railroads by the ICC are affecting you, your family, friends and community." Since then, anti-piggyback letters have been pouring into Congress.

It also stated that legislators "should realize the harmful effects of this great loss of tax revenues on state and local areas and on the progress of our roadbuilding program." Two states, Arizona and Oregon, are studying proposals to place a tax on trailers shipped into the state by rail.

It's about time that railroad employees make their voices heard. Certainly, with railroad employment consistently showing annual decreases, anything which railroaders can do to arrest the decline and possibly increase employment should be done.

Members of Congress pay attention to letters they receive which are honestly written by their constituents. Every reader of this magazine should write his congressman urging fair treatment for the railroads on this matter. The future of the railroad industry is at stake.

Machine buying today needs accurate cost data

The mechanization of maintenance-of-way work has entered a new phase. Until relatively recently maintenance officers, in considering the purchase of machinery, were dealing with a fairly simple proposition. The purpose, of course, was to save man-hours. Not too long ago it was not unusual to encounter track gangs containing several hundred men. Neither was it unusual to find single machines, such as production tampers, that would do the work of eight or twelve or more men.

Under these circumstances it was a simple matter to justify the purchase of equipment. In many cases it could easily be shown that a machine would pay for itself in a single working season or even less through savings over the existing method of doing the work. And this could be done even where only approximate information was available on the cost of doing the work.

Some basic changes have now taken place. For one thing, while there are still opportunities for saving labor, the possibilities are not as great as they were during the early stages of mechanization. In many cases the machinery in use has reduced the size of gangs to the point where only a handful of men remains, with the result that opportunities for further reductions are limited.

Another consideration is that mechanization has progressed to the point where a great deal of machinery is being bought to replace existing machines either because the latter have reached the end of their service life or because more efficient or productive equipment has become available.

There is still another consideration that should be mentioned here even though it has no particular bearing on this discussion, and that has to do with equipment situations where workmanship is at least of equal importance with economy in dictating the purchase of equipment. Machines for applying rail anchors are considered by some maintenance men to be in this category.

In any event it is apparent that the selection and purchase of machinery has become a more precise science than it was a few years ago. The figuring of prospective savings requires a sharper pencil than before. To be specific it requires more exact cost data than generally have been available in the past. It is necessary to know precisely what the unit cost is using present equipment and methods and to have accurate information on the unit cost that would prevail with the proposed equipment.

In an address before the annual meeting of the American Railway Engineering Association last month C. J. Henry, chief engineer of the PRR, stated that "a methods and cost control system is a *must* in determining unit costs so necessary in the preparation of programs." It could as well be said that a methods and cost control system is a *must* in determining unit costs so necessary in deciding on the purchase of new equipment.

There was a time when an engineering department could apply "rules of thumb" in making decisions to purchase new machines. Such methods can no longer be relied upon to give the desired results.

NOW THERE IS A TRACK LEVELER THAT CAN KEEP PACE WITH THE MATISA SPEEDTAMPER

SPOT TAMPING

Dips and isolated low points along track are **automatically** raised and consolidated to the **proper longitudinal** and **cross level** with the *Matisa Track Leveler*, using the existing track as a reference.

SMOOTHING

Irregularities are evened out without raising high points with the use of a *Matisa Track Leveler* moving from tie to tie in a **continuous** operation. The operator tamps to levels **automatically** adjusted to **proper longitudinal and cross** levels using existing track as a reference.

SURFACING

A systematic, continuous, **automatic** operation with the *Matisa Track Leveler*. In surfacing, the raise is accomplished **automatically** with a slight equipment adjustment. The result is the same as smoothing—a consolidated track level, irregularities reduced, track restored to original smoothness.

PRECISION SURFACING

Perfect levelling, with **straight line** consolidation of track in 300-foot segments! With a fixed transit sighting on a remote reference point, **meticulously accurate** progress of the machine along the line of sight is assured, providing **exact** longitudinal track level. Run-offs are **automatically** obtained by a simple adjustment of the equipment.

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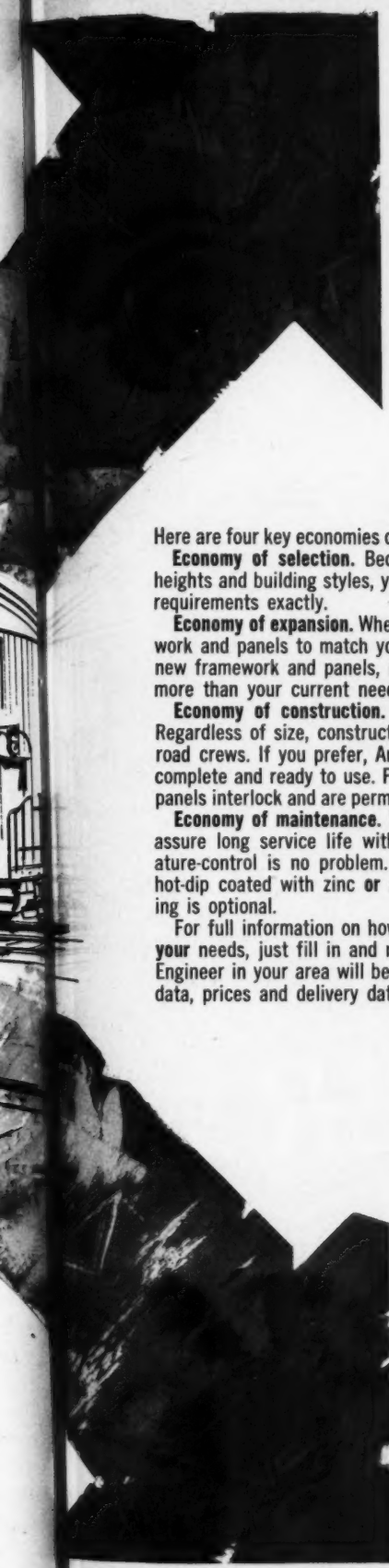

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Here are four key economies offered by the new line of Armco Steel Buildings:

Economy of selection. Because of the much wider selection in widths, heights and building styles, you can specify the structure that matches your requirements exactly.

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For full information on how Armco Steel Buildings can meet **your** needs, just fill in and mail the coupon. The Armco Sales Engineer in your area will be glad to supply you with technical data, prices and delivery dates.

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Heavy-duty OXWELD MW rod builds up battered rail ends...

The metal in an OXWELD MW steel rod will stand up to more battering than the rail on which you use it. Designed specifically for heavy-traffic rail steel, MW rod produces a hard, abrasion-resistant surface of high tensile strength and builds up battered rail ends. Since it responds to heat treatment, MW rod is also valuable for repairing parts that must be flame-hardened.

"Hard-as-rails" OXWELD DRIBURN rod builds up driver burns, frogs, and switch points...

Because this metal is formulated for the same hardness as rail steel, it wears at the same rate. This eliminates the problem of secondary batter. Check driver burns before they can cause trouble. One major road used DRIBURN rod for almost 25,000 welds in 1958 without a single failure reported. Since DRIBURN rod is engineered for the most desirable flow qualities, welding can proceed quickly. You save on both labor and gases, the two most costly items in this operation.

USE THE W-24-R BLOWPIPE FOR BOTH

This is a general-duty blowpipe for sale only to railroads. Twelve different sizes of welding head are available, ranging from 4 cu. ft. to 80 cu. ft., and heating heads come in five sizes from 100 to 250 cu. ft. All use low-pressure acetylene.

For detailed information on rods and blowpipes, talk to your LINDE representative, or write Oxweld Railroad Department, Linde Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. *In Canada:* Union Carbide Canada Limited, Linde Gases Division, Toronto 12.

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Let us solve your weed control problem with the right chemicals and application service.

We offer the most comprehensive line of weed, grass and brush killers available . . . each product is formulated to solve specific vegetation problems and each is proved by extensive railroad use.

Chipman Railroad Application Service includes both highly experienced personnel and the most modern equipment for efficient, economical treatment.

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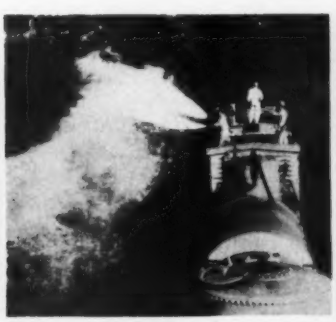

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Railway TRACK and STRUCTURES

APRIL 1961
Vol. 57, No. 4

E. J. BROWN, president of the AREA, addressing opening session on Tuesday, March 7.

Progress is keynote of AREA convention

New areas where engineering development offers "rewarding opportunities" were outlined by a speaker at last month's meeting in Chicago. Future AAR research projects, types of machines still needed and epoxy resins also were discussed. Concurrent NRAA exhibit was biggest ever.

REGISTRATION OF 1,251 members and guests on the day before the convention opened topped all records. Total registration was 2,349, exceeded only by 26 in 1955. Members registered in exhibit hall, then went downstairs to attend the meeting.

WITH EXHIBITS of 107 supply companies occupying 100,000 sq ft of floor space in McCormick Place, the exhibition of the National Railway Appliances Association was the largest on record. Many exhibitors expressed satisfaction with the new set-up.

● It was never like this before at an annual meeting of the American Railway Engineering Association. Never before could members move between the products exhibit and the meeting room without going out-doors.

This was possible because both the exhibit and the meeting were held in McCormick Place, Chicago's spanking new exposition center. The exhibit, sponsored by the National Railway Appliances Association, was located in the vast exhibition hall on the center's upper level. The main business sessions, as well as all related activities, including the annual luncheon, took place in rooms on the floor below.

The exhibit, which opened on March 6, was the largest in the history of the NRAA. It reflected, in the minds of observers, the rapid progress being made in the development of M/W machines, devices and materials.

Down in the meeting rooms the members were hearing addresses emphasizing progress in other areas of railroad engineering technology. In this category was the keynote address by C. D. Buford, vice-president, operations and maintenance department, AAR, presented at the opening session on Tuesday, March 7. Mr. Buford outlined a number of "rewarding opportunities" for further engineering development.

These include the mechanized handling of packaged freight, and the need for "aggressive programs aimed at fitting railroad plant to cur-

Speakers discuss wide range of subjects

KEYNOTE address was given by C. D. Buford, V.P. Operations and Maintenance, AAR.

EFFECT of heavy wheel loads on rail was told by G. M. Magee, dir. engrg. res., AAR.

RESEARCH — here and abroa — was subject of address give by W. M. Keller, AAR V.P.

Researchers study weed control, concrete ties, h

rent and prospective traffic levels" and "better utilization of the most desirable facilities . . ." There is also a need, declared Mr. Buford, for "new thinking on better utilization of railroad property, benefits to be had from yard revision," and "cooperative planning with communities to solve transportation problems."

"A concept urgently in need of careful analysis and planning," stated Mr. Buford, "is the integration of truck and container terminal facilities with railroad terminal yard facilities. The cost of providing switching service in industrial terminal territories is extremely high. A possible solution is to develop specialized rail cars for transferring bulk commodities to dump trucks just as containers may now be transferred to flatbed trucks. The transfers could be made in the vicinity of primary terminal classification yards so as to obtain quick delivery in major urban areas. The results should be faster release of rail equipment and dramatic improvements in equipment utilization."

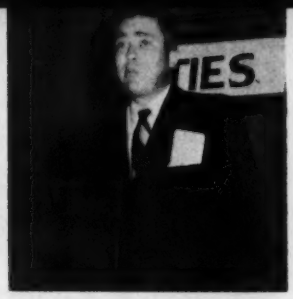
Following Mr. Buford on the program, W. M. Keller, vice president — research, AAR, said that "several interesting and imaginative types of projects" are proposed in the AAR's 1961 research program for track and structures. The possibilities of using means other than chemicals for control of vegetation will be studied, he said. "We do not know now what these means are, or we would, of course, not have a research project, but the type of destruction we are contemplating might include ultrasonic vibration, high-intensity heat rays, radiation energy, or perhaps even some type of power-driven contacting rollers that would literally pull weeds and brush out by their roots."

It is also proposed, said Mr. Keller, "to continue our development work on prestressed concrete ties, and we are concentrating particularly on improvement in the fastening means, studying the possible use of epoxies to provide a simpler and more easily insulated fastening. In fact, some thought is being given to elimination of tie plates, particularly

LABOR economies in maintenance came up for special discussion by C. J. Henry, PRR.

TRIP over Russian railroads was described and illustrated by F. R. Woolford, WP.

CONCRETE shapes for railroad structures were described by J. D. Piper, vice-president, PCA.



TIE suppliers told their side through D. B. Frampton, Jr., V.P., D. B. Frampton & Co.

LEFT — AREA Board of Direction in session on Monday, March 6, the day before the convention opened. Left to right around table — A. B. Hillman, treasurer (retired chief engineer, Belt Railway of Chicago — C&WI); T. M. von Sprecken, director (retired assistant to chief engineer, Southern); W. B. Throckmorton, director (chief engineer, Rock Island); T. F. Burris, director (chief engineer system, C&O); W. E. Cornell, director (engineer of track, Nickel Plate); J. A. Bunjer, director (chief engineer, UP); Norris E. Engman, assistant to secretary; Nancy Campbell, stenographer-clerk; N. D. Howard, executive secretary; R. H. Beeder, senior vice president (chief engineer system, Santa Fe); E. J. Brown, president (chief engineer, Burlington Lines); C. J. Code, junior vice president (assistant chief engineer-staff, PRR); B. R. Meyers, past president (vice president and chief engineer, C&NW); F. R. Woolford, past president (chief engineer, WP); F. L. Etchison, director (chief engineer, WM); C. J. Henry, director (chief engineer, PRR); J. M. Trissal, director (vice president and chief engineer, IC); W. W. Hay, director (professor of railway civil engineering, University of Illinois); W. J. Cruse, director (engineer M/W, GN).

NORTH WESTERN officers are: B. R. Meyers, vice-president and chief engineer; M. S. Reid, asst. chief engineer-maintenance; R. W. Bailey, engineer work equipment; J. P. Datesman, process engineer; and W. H. Huffman, asst. chief engineer-construction.

NORDBERG'S field manager J. R. Graham talks things over with V. E. Glosup, v.p.-oper. and chief engineer, Milwaukee.

FAIRMONT'S president R. G. Wade chats with C. D. Buford, vice-president Operations and Maintenance Department, AAR.

VISITORS at RT&S Coffee Bar are J. K. Stewart, Tamper, Inc.; A. V. Johnston, CNR; A. D. Henninger, Soo Line; J. W. Rapp, Tamper, Inc.; and B. R. Prusak, Soo Line.

hardwood pads

for yard use, using an epoxy to glue panels of concrete ties together. These panels would then be laid in track as is the practice in Europe, and jointed with bolted joints or field welds."

The AAR research staff, said Mr. Keller, is also "contemplating some studies with laminated hardwood pads glued to the tops of wood ties before they are treated. These pads would be the same size as the tie plate and would thus insure drainage of the water from under the plate until the laminated hardwood pad was worn away.

Another speaker with eyes on the future was C. J. Henry, chief engineer, Pennsylvania. Saying that there "will always be a need for new ma-

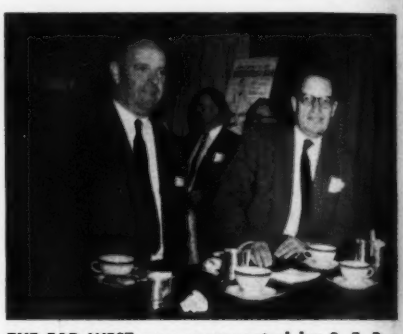
AREA cont'd

CATERPILLAR'S Joe Giles fills cup at coffee bar in exchange for boutonniere.

COFFEE BAR of Simmons-Boardman was a popular meeting place in mornings. Statistics on consumption: 70 gal coffee, 55 doz sweet rolls, in addition to fruit juices.

MP's R. H. Carpenter and Chatt. Val.'s G. W. Neal grab a quick cup.

ROCK ISLAND'S G. W. Becker and J. R. Williams stop by for a morning pick-up.



THE FAR WEST was represented by S. F. Burmeister and A. W. Carlson (both WP).

Speakers discuss equipment needs, method

ines," Mr. Henry said these needs include "a device for inspecting track that will record gage and cross-level conditions and operate over track at an average speed of over eight miles an hour, a machine that will tighten bolts at the rate of one mile per hour, and brush cutting machines adaptable for use on rough terrain." He also mentioned the need for "a dependable soil sterilant that may be applied at a cost of $10 per acre, a centralized traffic control system that may be installed for $5000 per mile, a dependable snow melting device for switches that will function in winds of 25 mph at subzero temperatures, improved welding machines for bridge repairs and off-track tamping equipment."

Mr. Henry also spoke of the use of method studies to increase productivity. "First a study is made," he said, "using one or more of the available techniques to determine the actual time required from each part of the job. This is broken down into sufficient detail to permit a complete analysis of the process. The information can then be plotted on charts to determine how unproductive time may be reduced."

"A present-day budget," said Mr. Henry, "may be defined as a method of worrying before you spend, instead of afterward."

What's happening in concrete

Recent engineering advancements in concrete construction that are of especial significance to the railroads were the subject of an address by James D. Piper, vice president for promotion, Portland Cement Association. "Probably the most dramatic advance in construction," he said, "is the use of shell concrete to form the new shapes in roofs for applications such as warehouses, terminals and shelters. All or many of these new shapes accentuate a futuristic outlook; they are not combinations of artistic gingerbread. In the most practical sense, they represent technological improvements that make possible roof spans of a hundred or more feet with as little as three to four inches in thickness."

Types of concrete shells used in railroad structures, as described by Mr. Piper, include the multiple-barrel shell, "with its graceful accommodations of vast storage areas," the folded-plate concrete roof, and the hyperbolic paraboloid shell. Shell-type structures, said Mr. Piper, "combine practicability, economy and beauty in a fashion that is unique in construction today."

Discussing prestressed concrete as "a second important development in the field of concrete construction," Mr. Piper described a number of railroad bridges and buildings con-

MAINE CENTRAL'S R. A. Jackson (left) and J. W. Wiggins (right) discuss plans with Fairmont's F. C. Sautter and W. H. Ripken.

NO GLOOM here. A. L. Fridley and T. E. Schofield, (both Unit Rail Anchor) with T. W. Long and F. E. Huddleston (both C&O).

SON AND FATHER, F. L. and W. R. Rees (both Santa Fe) prepare to inspect exhibits.

SANTA FE'S W. R. Wilson and W. R. Hyma, both of Chicago, pose cheerfully.

PRR's W. T. Hammond (center) with C. Keen, M. S. Westlund (Jackson Vibrators).

OLD FRIENDS W. E. Cornell (Nickel Plate) and W. B. Throckmorton (CRI&P).

DEEP SOUTH was represented by Glenn Hunt (G. C. Hunt Co.), and R. L. Fox (Sou).

KERSHAW's Royce Kershaw, E. E. Bode, C. H. Anderson and J. F. Bryan, Jr.

studies, new concrete designs, epoxies

structed of this material. But it is the concrete crosstie, he said, that "has really moved to the center of the stage." In support of this statement he cited test installations of such ties that have been made on the Seaboard Air Line, the Atlantic Coast Line and the Western Pacific.

"Epoxy Resins – A New Tool for the Railroad Industry," was the subject of an address by Dr. W. J. Belanger, director of resin development of Jones-Dabney Company, a division of Devoe & Raynolds Co., Inc. Dr. Belanger listed these possible uses of epoxy resins in the railroad industry: (1) Bonding old concrete to new concrete; (2) surfacing car-washing platforms; (3) splicing concrete piles; (4) protection against corrosion; (5) bonding a composite section of concrete and steel; (6) fastening masonry plates to concrete; and (7) waterproofing of concrete.

OUTGOING president E. J. Brown salutes president-elect R. H. Beeder.

Here are the new officers

In the election of officers R. H. Beeder, chief engineer system, Santa Fe, was advanced from senior vice president to president; C. J. Code, assistant chief engineer – staff, Pennsylvania, was automatically advanced from junior vice president to senior vice president and L. A. Loggins, chief engineer, Southern Pacific Lines in Texas and Louisiana, was elected junior vice president.

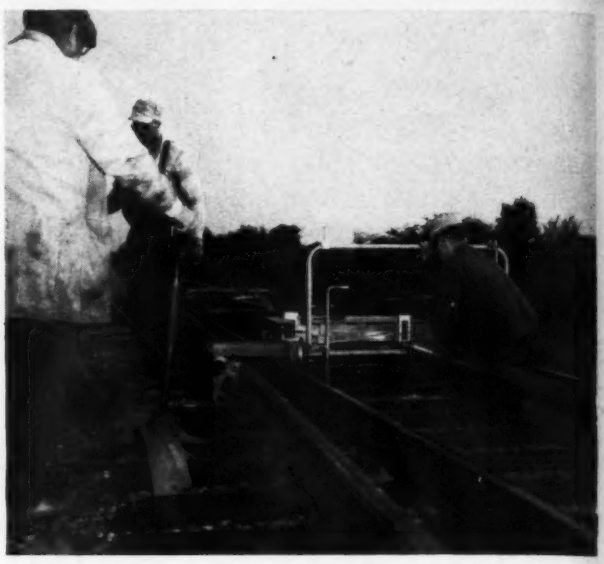
New directors elected are: J. H. Brown, assistant chief engineer, Western District, St. Louis-San Francisco; J. E. Eisemann, chief engineer, Western Lines, Santa Fe; W. H. Huffman, assistant chief engineer – construction, North Western; and F. R. Smith, chief engineer, Union Railroad.

Members elected to the Nominating Committee are: C. E. Ekberg, Jr., head, department of civil engineering, Iowa State University; C. E. Weller, assistant engineer maintenance of way, Illinois Central; W. L. Young, chief engineer, Norfolk & Western; John Ayer, Jr., chief engineer, Denver & Rio Grande Western; and C. E. Defendorf, chief engineer, New York Central.

Introducing sand tamping

• What it is

• How it's done



1 Midget Surfacer was being used on this job to locate low spots and to determine raise needed. Raise is made with a hand jack.

● In their search for interesting article material magazine editors occasionally come upon developments which, while yet unproven, appear to be worth reporting. Such a development is sand tamping or shimming.

This practice first came to the attention of this magazine last September during a field trip being made by a staff editor in the company of W. B. Blix, vice president of Nordberg's Railway Equipment Division. Main purpose of the trip was to inspect this company's newly developed Switchliners in operation.

Conversation brought out the fact that Nordberg had for some time been investigating the many maintenance problems relating strictly to turnouts and crossovers. Lining was only one of these. Surfacing was another. Since frogs, switch heels, insulating joints, and short rails in turnout areas must be resurfaced relatively frequently, an attempt was being made to find an answer to the question: "Is there some better method than those presently being used for tamping turnout ties?"

Three main steps

Many methods tried

Trackmen over the years have tried every conceivable method and material in raising and tamping track. A system used widely in Europe involves the application of a shim of fine material between the tie bed and the bottom of the tie. This system is called by various names. In England it is referred to as the "canister" method. It is used for spot surfacing any low spots, regardless of location. Piles of the shimming material are unloaded at intervals along the right of way so that the track gangs have a ready source of supply. Many American railroad men who have seen this method in use abroad have tried it on their own properties but found it too costly and slow compared to the methods in use.

A similar method, used for many years and still employed on some roads, is known as "trowelling." In this system a shim of material is introduced between the bottom of the tie and the tie bed on a long flat-bladed tool. Since the shimming material consists of available ballast from the shoulder, this method is confined principally to track ballasted with light gravel, chats or cinders.

One of the drawbacks of the "canister" and the "trowelling" methods lies in the rather complicated procedures used to determine how much material to introduce under the ties.

The question being investigated by Nordberg was whether the idea of introducing some sort of a ballast shim between the tie and the tie bed could be applied to the surfacing of a turnout. Sand was the material being used. The procedure was as follows:

Low spots were located with the aid of a Nordberg Midget Surfacer.

Nozzle is simple device

The special nozzle used to blow the sand under the ties can be made in any M/W equipment shop. It consists of a ½-in I.D. steel tube, 36 in long, with a short length at the nozzle end bent at an angle so that it may be readily inserted under the tie by a man in a standing position. The nozzle end of the tube is flattened to produce an opening about ¾ in long by 3/16 in wide. To the top side of the flattened portion is welded a shorter steel bar in a vertical position to act as a guide or stop.

At the opposite end of the tube, and joined to it at an angle, is a short section containing a valve and a coupling for attaching the air hose. For use in handling the nozzle two hand grips are welded to it in convenient positions.

2 Using shovels holes are opened at ends or sides of ties to be tamped. Small piles of sand have been placed on several ties.

3 One man nips tie, another handles the nozzle and a third feeds sand to nozzle. Air pressure packs sand under tie.

A hand jack was used to raise each low spot ¼ in above the correct level and the ties to be tamped were marked. With the track supported in the raised position on the jack a hole was opened at the end or side of each tie to be tamped, using a shovel for this purpose. Sand was then fed into this hole from a handheld No. 2 shovel. A special, simply constructed, handheld air nozzle directed a stream of compressed air into this sand to blow it into the void under the tie. Simultaneously the tie was nipped with a bar to bring it up to full bearing against the rail base. After the ties marked for tamping at the low spot had all been "sand shimed" in this manner, the jack was "snapped off."

This simple method was developed only after a number of other ideas had been tried out without success. At first an attempt was made to feed chips or sand from a bin to a nozzle through a large-diameter flexible hose. This scheme reportedly worked fine when the material was bone dry, but it was found that even a small amount of moisture prevented free flow of the material.

Next, a rather small hopper was built into the blowing gun and this hopper was kept filled with a shovel. Again, the scheme worked satisfactorily as long as the material was dry but not when it was damp. However, it was found that even fairly wet material could be applied by placing it in a hole at the tie and blowing it in directly by the special nozzle.

'Torpedo' sand used

The sand being used was a washed "torpedo" sand obtained from a local quarry. The force consisted of a foreman and three laborers. Air was supplied by a two-wheel, rubber-tired, 60-cfm air compressor carried on a push car.

No particular claims are made for sand tamping. Its applicability is doubtless limited to the surfacing of special locations like turnouts and under certain conditions. Quite likely also its use would be confined to locations where the ballast consists of gravel or fairly fouled crushed stone, that is, where the absence of voids would prevent excessive loss of sand.

Naturally, further testing is necessary to determine if the method has advantages. Rather brief tests are said to indicate the possibility that sand shimming may "stand up" longer than present methods. Also, there is some thought its use may increase switch timber life by minimizing tamping damage. If sand tamping is used by any of its readers this magazine will be interested in learning of the results obtained.

COMPRESSED AIR was furnished by a two-wheel, rubber-tired, 60-cfm air compressor carried on a push car. Push car also was used to carry supplies to job.

NEW 129-ft deck-plate girder span (background) and two 10-ft 6-in beam spans, one at each end, were constructed to replace two 60-ft girder spans and one 30-ft tower span. Wider opening permitted a new highway to be constructed under the 850-ft long viaduct.

Fast swap for spans in long B&O viaduct

● Traffic on the Baltimore & Ohio's long single-track steel viaduct near Homer City, Pa., was interrupted for only 10 hr while three of its spans were being replaced by a long span. The new span affords a wider opening in the viaduct to accommodate a highway relocation project.

Located on the Lucerne branch of the road's Buffalo division, the viaduct is 850 ft long, and consisted of a series of 60-ft open-deck, deck-plate girder spans alternating with 30-ft tower spans. The need for a wider opening through the viaduct was occasioned by a project to relocate and widen U.S. 119, which passes underneath. The new dual-lane highway, which intersects the railroad at approximately a 45-deg angle, required a minimum clear width of about 100 ft.

To provide the required clearances, B&O engineers decided to install a 129-ft span over the highway. What they did was to remove one tower span and the adjacent 60-ft spans and replace them with a 129-ft ballast-deck girder span, plus a 10½-ft beam span on each end to extend from the new piers back to the adjacent steel towers.

Preliminary work included the construction of two concrete piers to support the 129-ft span, which were placed about 12 ft from the towers that were to remain in place. When these were completed the steel erector, Bethlehem Steel Company, commenced to assemble the new span on two falsework towers located beside the new piers. The top of each tower was provided with a solid deck on which two lines of 100-lb rails, spaced about 14 in apart, were laid. The rails extended across the towers onto the piers to facilitate movement of the new span into place.

The 75-ton riveted girders were fabricated at Bethlehem's Rankin (Pa.) works and were delivered to the site by rail. The griders are 11 ft deep and were fabricated full length to minimize field work. At the site, each girder was placed on two sets of eight-wheel trucks, one at each end, operating on the tracks on top of the falsework towers. When the span was fully assembled the shallow U-shaped concrete deck was constructed, and ballast and ties were placed.

On "D day" the viaduct was taken out of service. A crawler crane, operating from the deck of a flat car, removed the rails and ties from the spans that were to come out. Another crawler crane, working below

Shift was made in four carefully planned steps

1 On "D-day," service over old bridge was discontinued and the rails and ties removed from the three spans that were to come out. Each old span was then removed as a unit.

2 Tower was cut apart by torches and the members scrapped. The work of removing the three old spans and dismantling the tower was accomplished in approximately three hours.

LONG SPAN was erected after new piers were completed. Each girder was 11 ft deep and weighed 75 tons. They were fabricated in one piece to minimize necessary field work.

MOVEMENT of new span to its pier (below) was facilitated by four 8-wheel trucks. Trucks at each end of span operated on two lines of rails which extended across falsework tower onto the new pier.

the viaduct, removed the three old spans. The tower was cut apart and scrapped. This work was accomplished in about 3 hr.

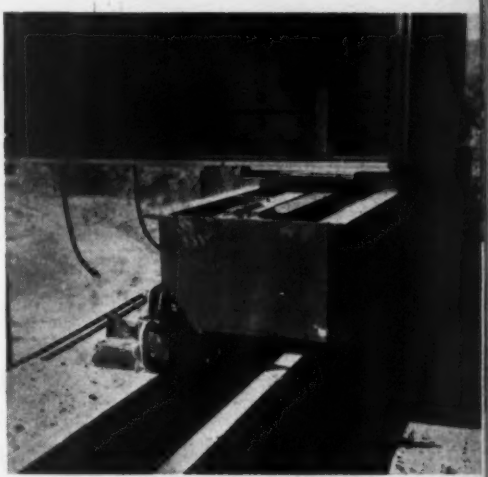
The 129-ft span, complete except for the rails, was then rolled into position on the piers. Four 250-ton hydraulic jacks were used to lift the span off the trucks and lower it onto its bearings.

Two 60-ton crawler cranes, operating below the viaduct, furnished the power for moving the 600-ton span. This was accomplished by means of a block and tackle arrangement at each pier.

With the 129-ft span in place, the Bethlehem crew installed the two 10½-ft beam spans to close the gap created by removing the old spans.

Contract for the entire project was awarded by the Baltimore & Ohio to the Steel City Contracting Company of Pittsburgh, Pa. Bethlehem's work was accomplished under a sub contract with Steel City.

Plans for the project, including the general scheme of erection, were prepared by the consulting engineering firm of Richardson, Gordon & Associates, under the general direction of Abram Clark, the road's engineer of bridges and buildings. M. S. Norris, regional engineer at Pittsburgh, was in charge in the field for the B&O.



3 New span was moved onto its piers by two crawler cranes working on ground. Pulling force was exerted through sheaves attached at the base and top of new piers and to new span.

4 Gaps between ends of new span and adjacent tower spans were closed with 10½-ft beam spans. Service was interrupted for only ten hours on day changeover was made.

COMPLETED UNDERPASS invites use by students going to and from new junior high school (background) at Columbus, Ohio, by making it easier for them to go under tracks than to wal over them. Landscaping adds to attractive appearance.

Big concrete pipe for school c

INSIDE JOINTS were sealed with non-shrink mortar for insuring watertight construction. Floor of underpass was paved.

At Columbus, Ohio, it was found necessary to provide a means of permitting junior high school students to cross the New York Central main tracks safely. The solution adopted was to install a pedestrian underpass consisting of 80-in by 80-in precast concrete pipe with ramp approaches.

● When it was building a new junior high school, the City of Columbus, Ohio, found that a large number of teenagers resided on the other side of the New York Central main tracks. It was confronted with the problem of getting these students back and forth across the tracks safely.

Since the tracks were approximately at ground level, a pedestrian crossing could be built overhead or beneath the tracks. It was reasoned that the youngsters would refrain from walking directly over the tracks and would be inclined to use a walkway if steps were eliminated. Accordingly, it was decided to install a

JACKING POWER was provided by two 200-ton hydraulic jacks. Thrust was transferred to 80-in by 80-in concrete pipe sections by a special 18-in section.

AIR-POWERED spade and hand shovels were used to excavate clay.

EXCAVATED clay was loaded into muck buggy for disposal outside of pit.

crossing is jacked in place

large pipe beneath the tracks with easy sloping ramps at each end. For this purpose the railroad selected 80-in by 80-in precast concrete flat-base pipe furnished by the American-Marietta Company. To preclude interference with rail traffic, it was further decided to install the pipe by using the jacking method.

As a preliminary step the contractor dug a jacking pit, approximately 13 ft wide by 17 ft long by 15 ft deep to one side of the right of way, and shored it. In it he constructed his jacking frame at the desired level and installed two 200-ton hydraulic jacks.

The pipe sections were lowered into the pit by a crane. Each section was four feet long and weighed 11,700 lb. As the jacking work progressed three men removed the earth from ahead of the pipe, using an air-powered spade and hand shovels to dig out the hard clay. This material was loaded into a three-wheeled muck buggy which was pushed from the pipe head to the jacking pit where it was lifted out and unloaded by the crane. Lights were strung overhead as the digging proceeded so the work could be progressed on a 24-hr basis.

The jacking thrust was transferred to the pipe by a special 18-in section of the same-size pipe. The maximum thrust needed was 360 tons, or 180 tons on each jack. Manila rope was used at the joints to help distribute the jacking thrust from one section to the next. The work proceeded at an approximate rate of 4 in per hour, or 8 ft in 24 hr. The desired alinement was maintained by regulating the positions of the jacks on the pipe.

After the pipe had been jacked about 108 ft, an excavation was made at the far end and the remainder of the pipe was laid in an open cut. A joint mastic was used to fill the outside joints. The inside joints were sealed with a non-shrink mortar to provide water-tight joints. The base of the tunnel was paved.

To give access to the pipe open cuts were excavated at each end. Concrete headwalls and sloping ramps with concrete retaining walls were constructed. Catch basins were built at each end of the tunnel portion and sump pumps were used to take care of the drainage until a new storm sewer was laid, after which the catch basins were connected with the sewer. Permanent light fixtures were installed. The areas on each side were sodded and landscaped. The result was an attractive underpass which was completed in time for the formal opening of the school.

TEST SITE showing tops of two test piles under 36-in wide-flange jacking beam. Latter beam is held down by 24-in transverse beams placed at anchor bents of untreated piles.

Tests give design load for timber piles

● A design load of 40 tons for Class B (ASTM D25-58) creosoted wood piles can be applied safely throughout the country where soil conditions are similar to those in the Chicago area.

This was the primary recommendation that came out of a recent series of loading tests made at Chicago to determine the ultimate capacities and safe working loads of treated timber piles. The tests were made at a site where borings indicated there is about 5 ft of fill underlain by 13 ft of sand, then 21 ft of stiff to tough clay, then hardpan.

Sponsor of the tests was the American Wood Preservers Institute. They were carried out under the direction of McClurg, Shoemaker & McClurg.

Eight piles were tested, four of which were Class A and four Class B piles. In each group one pile was oak, two were southern pine and one was Douglas fir. They were driven by a Vulcan No. 1 single-action hammer to a penetration of 5 blows per inch. As nearly as could be determined the test piles penetrated from 3 ft to 3½ ft into hardpan.

Loads were applied by hydraulic jacks bearing against a 36-in WF-300-lb steel beam held down by 24-in beams fastened to a series of five anchor bents, consisting of untreated timber piles.

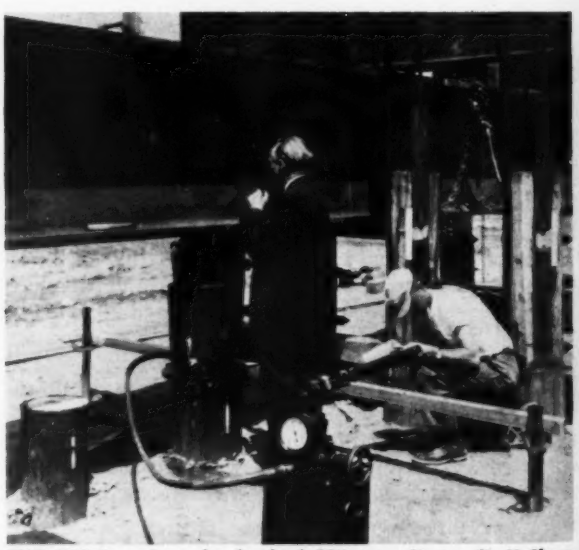
The specifications governing the test provided for a preliminary loading of 100 tons per pile after which all piles were to be tested to failure by a second loading. One 350-ton and two 100-ton hydraulic jacks were used for loading. The downward movements of each pile were measured and checked by three different means: (a) Two Ames dials reading to 1/1000 in; (b) a surveyor's level; and (c) a piano wire stretched adjacent to the piles.

Of five piles tested to failure the loads at which failure occurred ranged from 122 to 235 tons.

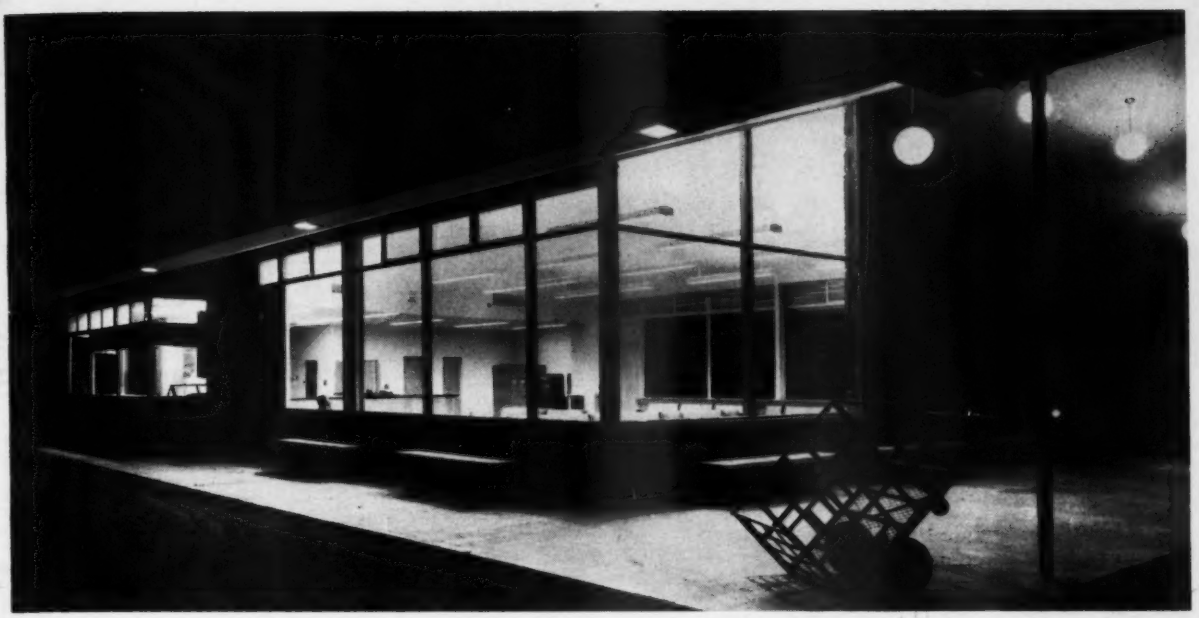
One of the conclusions reached by the engineers as a result of the tests is that either a Class A or Class B pile will have an ultimate load-carrying capacity of much more than 100 tons provided that the pile is driven to approximately ¼-in penetration per blow with a Vulcan No. 1 hammer where soil conditions are similar to those at the test site.

The recommendation that a design load of 40 tons be used for Class B wood piles was made on the basis that the pile is driven, with a Vulcan No. 1 hammer, to an average penetration of 12 to 15 blows for the last 3 in, and in soils similar to those at the test site.

INSTRUMENTMAN in foreground uses level to check for movement of pile under load. Another man reads Ames dial.



TEST PILE here is under load of 235 tons. Verne O. McClurg, (in suit) observes rust flaking off jacking beam under stress.



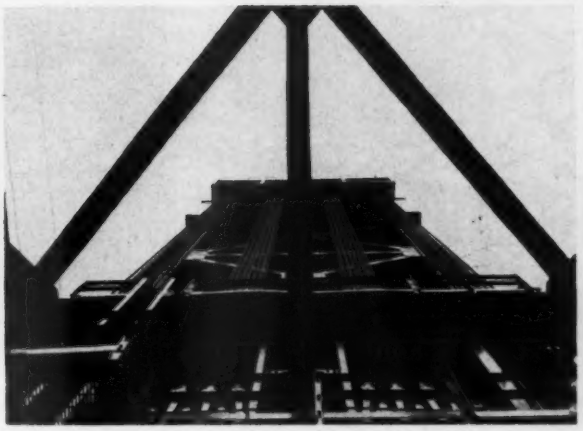
New station on big line change

The Santa Fe has constructed a modern brick passenger station (above) at Williams Junction, Ariz., the eastern terminus of its new 44-mile line change in northern Arizona. The new station serves passengers bound for Grand Canyon. One wall of the waiting room (right) is lined with malpais stone, which composed 30 per cent of the excavation for the new line.

News briefs in pictures . . .

New ties from old ties

At the New York Central's Technical Research Center at Cleveland, Ohio, a project is underway to make new ties from old ties. The process consists of mechanically whittling the old ties into chips, coating the chips with adhesive and forming them into a new tie by combined heat and pressure.



Steel 'muscles' for big bridge

More than three miles of "muscles" have been installed in the Pennsylvania's new Delair bridge for raising its 542-ft lift span. The muscles consist of ninety-six 2⅜-in diameter prestressed wire ropes, each about 171 ft long. They were installed by the steel erector, American Bridge Division of U. S. Steel.

PRODUCTS

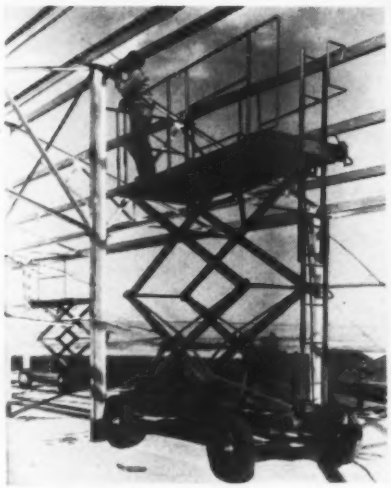
Improvements made to . . .

Cribber-adzer

A NUMBER of improvements have been made to the Kershaw Model 1ZA Crib-Adze. The machine, which is designed to reduce the cribs and adze ties during rail-relaying operations, now is equipped with a new and improved cross-level adjustment system, a redesigned and stronger crawler chain arrangement and an improved ballast deflector guard. In addition, several other modifications have been made to improve the overall operation of the machine.

The Crib-Adze, which is hydraulically self-propelled, is powered by a diesel engine and is equipped with two-wheel, air-operated brakes. A hydraulically operated center turntable is provided for reversing direction and for setting the machine off the track. *Kershaw Manufacturing Company, Dept. RTS, 2205 West Fairview Ave., Montgomery 1, Ala.*

(Circle 142 on TIME-SAVER card)

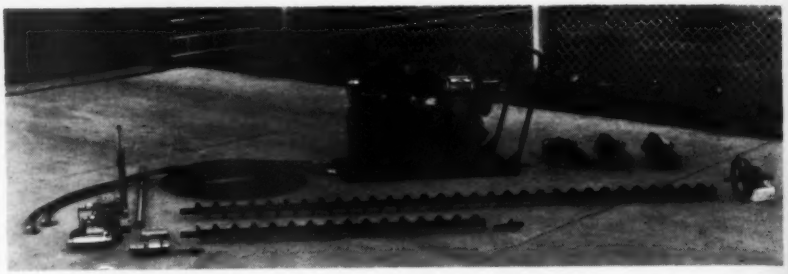


Versatility claimed for . . .

Work-Load Lift

DESIGNED for overhead maintenance and construction work, the Sky Witch portable hydraulic Work-Load Lift not only raises men and material to the proper working height but also provides a stable platform from which the work can be accomplished. The unit shown in the photograph is the Model 10-1117, which is capable of raising 1,000 lb to a height of 17 ft. This unit is mounted on pneumatic tires and utilizes a gasoline engine to power the hydraulic system. Other models are available which provide different weight capacities and lift heights. In addition, several power options are available and the units can be mounted on casters or skids. *The Charles Machine Works, Inc., Dept. RTS, Perry, Okla.*

(Circle 143 on TIME-SAVER card)



For drainage pipes . . .

New earth auger

A PORTABLE hydraulic earth auger is available for boring under streets, tracks and roadways, for installation of subgrade drainage pipes and for cleaning culverts. The power tool itself is compact and lightweight, weighing only 25 lbs, and is reversible. Oil pressure is supplied by a gasoline-engine-driven power unit which is mounted on either skids or wheels. Other equipment includes 35-ft hoses, 4-ft and 8-ft augers in 3-in and 4½-in sizes, cutting tips, and reamers. *Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.*

(Circle 144 on TIME-SAVER card)

Controlled by one man . . .

Ballast dump car

EQUIPPED with 7 ft hydraulically controlled hopper doors, the new Compact Ballaster dump car is available for distributing ballast during surfacing or other track-maintenance or construction operations. The car, equipped with flanged wheels, is 10 ft 6 in long, 7 ft 11 in wide and 5 ft high. It weighs 3800 lb and has a capacity of 30,000 lb. Flow of ballast out of the hopper doors is controlled by a hand-operated hydraulic pump. The pump is operated by one man who stands on a platform on the side of the car. Ballast can be cross-dumped for the full width

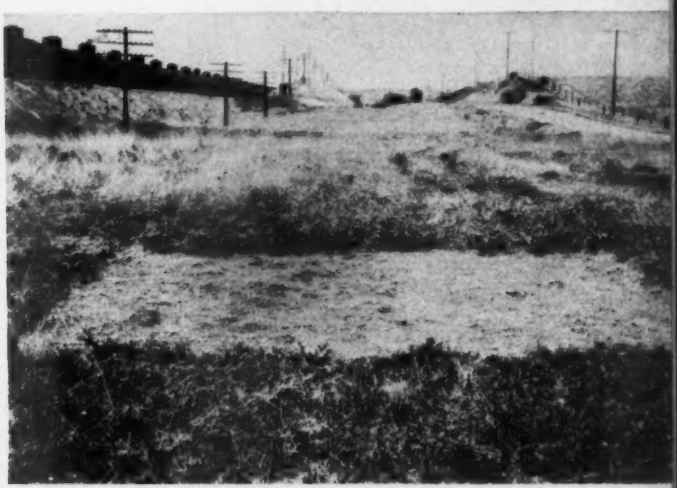
WEEDS AND GRASSES

One-application control—The Reading Company sprayed Du Pont KARMEX® diuron in their Port Richmond, Philadelphia, yard early last spring. This is how the yard looked in August. Note the complete weed control in the treated area, left, compared with the vegetation in the untreated area at right. "Karmex" diuron or TELVAR® monuron weed killer (depending on local conditions) is the key to a long-lasting weed control program. In large-scale applications by individual roads and repeated tests by the Association of American Railroads, chemical combinations that include "Karmex" or "Telvar" continue to outperform other chemicals and chemical combinations used for weed control.

BRUSH

Efficiency with safety—Even along track bordering such highly sensitive crops as tobacco, cotton, soybeans, tomatoes and peanuts, you can control brush by spraying with Du Pont AMMATE® weed and brush killer without vapor damage to crops. That's because "Ammate" is non-volatile.

Another Du Pont herbicide, DYBAR® fenuron weed and brush killer, comes in easy-to-use pellets for convenient and economical brush control. Simply spread it at the base of brush clusters to do the job.



TOUGH PERENNIALS

Bindweed and certain other hard-to-kill weeds—TRYSBEN® 200 weed killer was applied to this test plot over a year ago. Note how thoroughly one application controls bindweed. "Trysben" 200 also gives best control of other deep-rooted perennials such as Canada thistle, leafy spurge, bur ragweed and Russian knapweed . . . also kills a variety of broadleaf weeds, woody vines and certain kinds of brush. It acts faster and more efficiently by attacking through roots and leaves.

How to get efficient chemical control of weeds...brush...and tough perennials

Whatever vegetation problem you have, a Du Pont chemical—or combination of chemicals—can help you. But where you need a combination, it's important to get the right "prescription" for the job because you are dealing with nature under conditions that are seldom alike. Our specialists will be glad to help you plan a complete program that will give you the most effective and long-lasting results at the lowest cost. Write: E. I. du Pont de Nemours, Industrial and Biochemicals Dept., Room 2543-N, Wilmington 98, Delaware.

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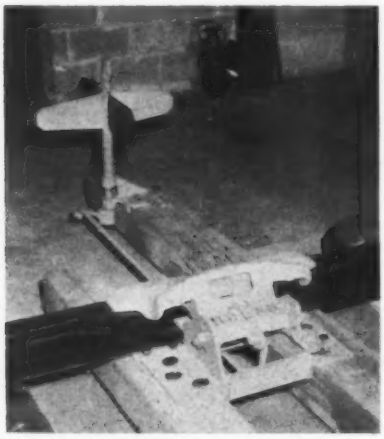
Better Things for Better Living
. . . *through Chemistry*

WEED and BRUSH KILLERS

On all chemicals follow labeling instructions and warnings carefully.

of the hopper doors or side-dumped at the end of the ties. The latter is accomplished by means of a removable cable converter pan. The car is equipped with rail sweeps and can be furnished with a removable flat pan for distributing spikes, bolts, tie plates, angle bars or crossties. The manufacturer states that the Compact Ballaster can be transported on a 1½-ton truck and that it can be towed along the track by a motor car. The new dump-car unit can be used to distribute ballast in tunnels or to carry and dump concrete or backfill. *Compact Rail Car Company, Dept. RTS, Chicago 80.*

(Circle 145 on TIME-SAVER card)



Hinged and sliding . . .

Derails and stands

TWO DERAILS, one hinged and the other of the sliding type, have recently been made available. The hinged derail (shown above) is adjustable for fitting any rail section. It comes complete with target post and rod. Provision is made for padlocking this derail either in the open or closed positions.

The sliding derail, complete with stand, is made of cast electric steel. It is said to provide easy operation and quick lubrication. *The Nolan Company, Dept. RTS, Bowerston, Ohio.*

(Circle 146 on TIME-SAVER card)

Electrical elements for . . .

Switch heaters

A NEW TYPE of electrical heating element has been made available for the protection of switches and movable crossings. These elements, designated Heatrex track switch heaters, have a neoprene seal vulcanized to the tube and terminal assembly, which is said to provide positive waterproofing and protection under any weather conditions. The terminals can be easily opened in the field without danger of water damage. They are available in either ½ or ⅝-in O.D. alloy tubing and can be formed to special requirements.

The manufacturer states that the elements can be furnished in heater ratings of 200, 350 or 500 watts per foot so as to provide various heating capacities suitable for most field conditions. Devices for manual and remote controls can be provided. Hair-pin heaters, ballast heaters and plate heaters also are available. *Heatrex, Inc., Dept. RTS, Meadville, Pa.*

(Circle 147 on TIME-SAVER card)

Versatility claimed for . . .

Crane-excavator

A NEW 5-ton crane-excavator has been added to the Schield Bantam Series 350 product line. Known as the Compact Model 250 Bantam, the machine can be equipped with five interchangeable front-end attachments—crane, backhoe, dragline, clamshell and shovel – to enable it to perform a wide range of light-duty lifting, excavating or rehandling jobs. The manufacturer states that the new units feature both cable and hydraulic operation. All digging and lifting movements are cable operated while a hydraulic system controls the swing. The upper unit of the Model 250 is powered by a four-cylinder gas engine which develops 37 hp at 1600 rpm. It is designed to swing through an arc of 370 deg at a speed of 5.5 rpm.

A new carrier is available for mounting the Compact Model 250 Bantam upper unit. Known as the Model 54, the carrier has a 4x4 drive and is powered by a gas engine which develops 135 hp at 4000 rpm. The new upper unit, however, will mount on any commercial truck having a clearance of at least 80 in between the center line of the rear axle and the back of the cab. *Schield Bantam Company, Dept. RTS, Waverly, Iowa.*

(Circle 148 on TIME-SAVER card)

Protect M/W crews with . . .

New radio system

A NEW radio-controlled repeater system is available for communication between maintenance-of-way crews and approaching trains while the trains are up to 25 miles away. The new system utilizes three mobile repeater units, two completely transistorized single-frequency receivers and one two-frequency transmitter, and the radio in the cab of the locomotive. Two of the mobile repeater units are mounted in trucks located on each side of the gang. The third mobile unit is mounted in a vehicle stationed with the crew. Communication can be initiated from the gang or the engine when the latter is within range. A call from either is received at the repeater station on one frequency and automatically retransmitted on the second.

All of the mobile units of the new system provide 25 watts RF power output and operate from 12-volt dc power sources. They are mounted in weatherproof housings. The mobile units of the new system use elements of the Motorola extensively transistorized MOTRAC radios. It is claimed that the low power drain characteristics of these units eliminate the need for heavy generators and allow operation of the radio without idling the engine of the vehicle in which it is installed. *Motorola, Inc., Communications Division, Dept. RTS, 4501 W. Augusta Blvd., Chicago 51.*

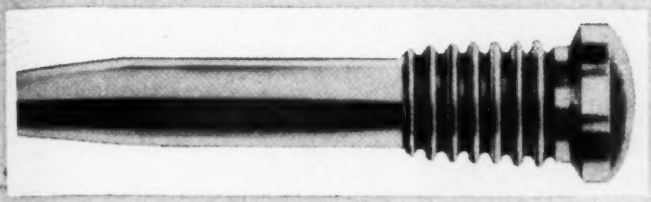
(Circle 149 on TIME-SAVER card)

(*More products on page 42*)

ALL ALONG THE LINE

THIS RACOR® TEAM EXTENDS TIE LIFE ..REDUCES SPIKING COSTS

A-8993-R1

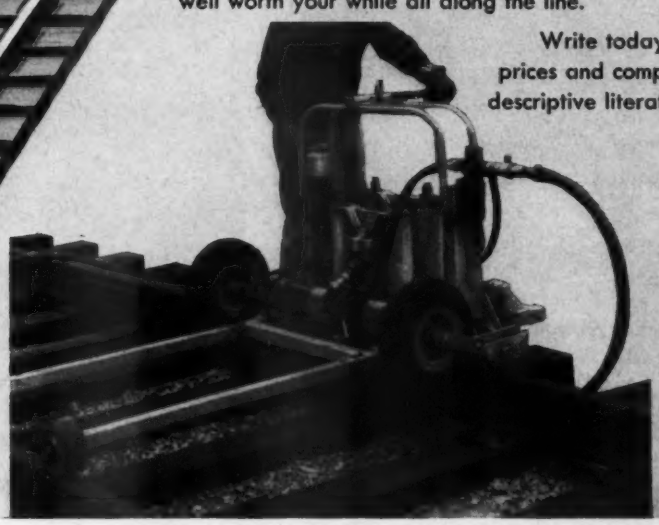


THE RACOR STUD (Patented)

Securely driven, becomes integral with tie plate and restricts lateral movement effectively. This adds up to greatly reduced tie abrasion, a reduction of spike killed ties and a minimum of tie splitting. In addition to this extension of tie life, Racor studs pay off handsomely in reduced track maintenance. Because these sturdy anchor studs maintain better line and gage, they defer tie replacement, and they reduce labor costs. Many tests have shown a reduction of 50% in tie wear. Put Racor studs to work on your road. They'll pay big dividends all along the line.

THE RACOR DUAL DRIVER DD-4 (Patented)

The DD-4 will drive Racor studs in the anchor position of tie plates and will effect substantial savings in line spiking costs. Studs or spikes are distributed in tie plate holes by hand. The DD-4 drives two studs or spikes simultaneously, then resets automatically for the next two. It has the advantage of two powerful pneumatic hammers, yet one man can drive twice as many studs or spikes without relief or fatigue. Take advantage of these time and cost-saving benefits. The DD-4 will prove well worth your while all along the line.



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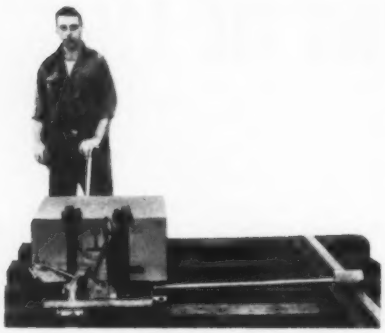
Quality products cut your ton-mile costs

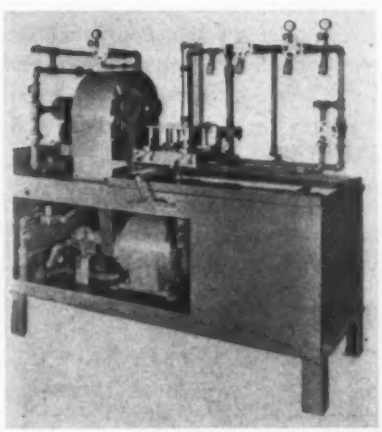


Aluminum alloy . . .

Track cart

TOOLS AND MATERIAL can be carried from the nearest highway crossing to the site of the work by means of the Raco Model 640-1 Trakart. Constructed from aluminum alloy, the unit weighs about 30 lb and has a capacity of 750 lb. The Trakart consists of a platform, an outrigger arm for stabilization and insulated flanged guide wheels which are ball-bearing mounted. When not in use the outrigger arm can be detached and used as a carrying handle. *Railroad Accessories Corporation, Dept. RTS, 405 Lexington Ave., New York 17.*

(Circle 150 on TIME-SAVER card)



For pin-pointing trouble . . .

Hydraulic tester

MAINTENANCE and repair of hydraulic systems of shopped machines are said to be made easier by the use of the Universal Hydraulic Test Bench. It is designed for testing hydraulic pumps, motors and valves. It checks the pump volume pressure and valves for leakage, and enables the pressures to be set on relief and sequence valves and pressure switches.

The test bench is made for 1,500, 2,000 and 3,000-psi service. It includes the necessary volume, pressure and vacuum gauges and flow valving for pump testing, plus enough quick connections to offer the repairman a wide range of valve tests. It is also said to be a dynamometer and will test hydraulic and small electric motors under working conditions of speed and load. The manufacturer states the unit has an adjustable pump-motor-mount table, a drive assembly capable of transmitting 50-hp loads, and can be powered with a 25 or 30-hp motor. Standard equipment includes a tachometer, micronic filters and removable work pan. *Schroeder Brothers Corporation, Dept. RTS, Box 72, McKees Rocks, Pa.*

(Circle 151 on TIME-SAVER card)

Introduces a new . . .

Concrete tie

A MIXED-TYPE concrete tie has been introduced in the United States by Sperry Products Company which will manufacture it under an agreement with the Societe d'Etudes Ferroviaries (STEDEF) of Paris. Known as the R.S. concrete tie, it is composed of two reinforced concrete blocks connected by a Y-shaped steel tie bar. The rail is fastened to the ties by means of double elastic spring clips. The ties also are equipped with rubber sole plates which are grooved in a chevron pattern. The fastening system is stated to permit elastic movement of the rails and tie while these elements remain closely interlocked. The fastenings are designed to dampen high-frequency vibrations in the rails and to fasten continuous welded rails securely to the ties. *Sperry Products Company, Division of Howe Sound Company, Dept. RTS, Danbury, Conn.*

(Circle 152 on TIME-SAVER card)

●

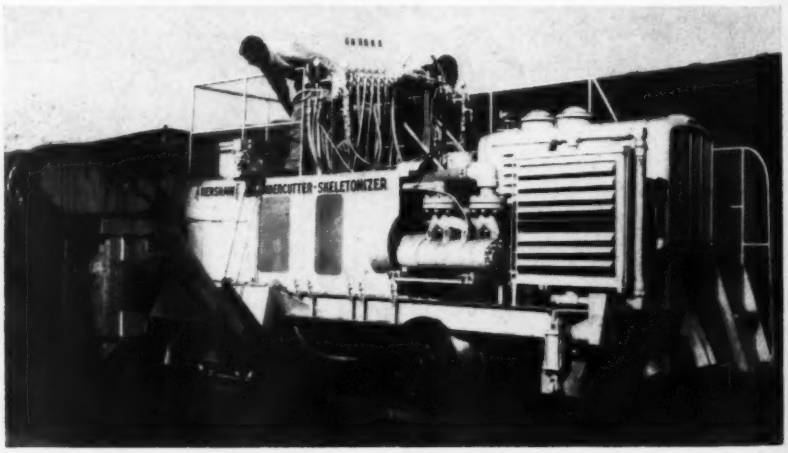
Diesels stimulated by . . .

Fuel conditioner

A COMPANION item, named "Diesel Pep," is being marketed by the manufacturer of Spray Products Starting Fluid. Diesel Pep is designed to improve the performance of all types of diesel engines. It is a combination of solvents, dispersants, special oils and other ingredients which are said to provide a formulation for cleaning gum and varnish from fuel lines, screens, injectors and other closely fitting engine parts. It is claimed that use of Diesel Pep will keep fuel pumps clean, improve engine combustion, disperse water and keep fuel lines open.

The manufacturer also states that the required amount of Diesel Pep is added to the fuel tank at any temperature and then the engine is operated in the usual manner. He recommends it for regular engine maintenance. For the initial treatment of diesel engines which have become sluggish and showing loss of power, double the usual quantity that is recommended. *Spray Products Corporation, Dept. RTS, P.O. Box 1988, Camden 1, N. J.*

(Circle 153 on TIME-SAVER card)



Three chain positions on . . .

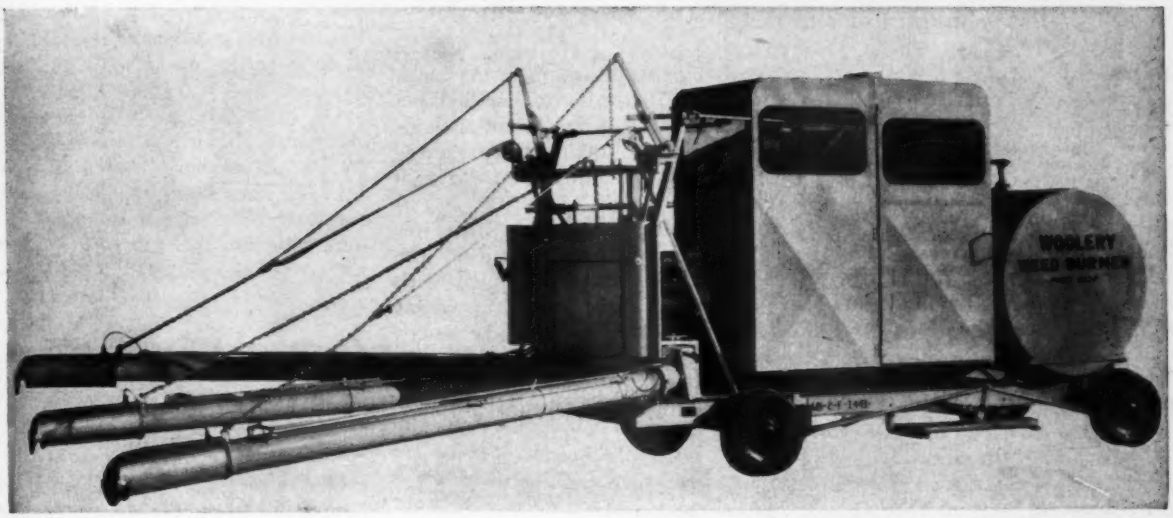
Undercutter

POWERED by a diesel engine, the Kershaw Model 1FU-D Undercutter-Skeletonizer utilizes a hydraulically driven main cutter chain for extruding ballast from beneath the track. The cutter chain is supported by means of pantograph-mounted work heads with three mounting positions. The different positions enable the cutter chain to accommodate various lengths of ties and varying side clearances in tunnels or at locations with other obstructions.

The unit is equipped with an automatic hydraulic crowd system which is designed to provide the optimum production rate under all conditions. The undercutter is hydraulically self-propelled on truck-type axles equipped with internal expanding air-operated four-wheel brakes. *Kershaw Manufacturing Company, Dept. RTS, 2205 West Fairview Ave., Montgomery 1, Ala.*

(Circle 154 on TIME-SAVER card)

WOOLERY "SNOWEEDER" DESTROYS WEEDS and MELTS SNOW FAST!



Separate Blower engine keeps heat at constant intensity when speed is reduced for clearing ice and snow from yards and switches

The model WB-2-F (illustrated) has automatic transmission with torque converter; constant blower speed regardless of rate of travel; an all steel cab with safety glass, two entirely separate brake systems and a final drive with chains and sprockets located outside the wheels for easy adjustment. A separate 15-H.P. air-cooled engine is used to drive the blower.

Other Woolery Burners include the Model COE which burns to a width of 25 feet using five burners, the PB-B 3 burner portable and the AB single burner portable.

Woolery also manufactures tie cutters, tie end removers, bolt tighteners, spike drivers, track tool transporters, motor cars and joint oilers. Literature and specifications on request.

WOOLERY MACHINE COMPANY

ESTABLISHED 1917 • **29th & COMO AVE., S.E.** • **MINNEAPOLIS, MINN.**

How small a tie plate?

Based on your own experience and not on theory, how small can a tie plate be and still be better than no plate when used on light-traffic branch lines? Explain.

Deters rail cutting

By M. D. KENYON
Roadmaster
Denver & Rio Grande Western
Grand Junction, Colo.

A small tie plate used with 75-lb rail on one of our light-traffic branch lines is a Wolhaupter plate 5¼ in wide by 7½ in long. The bottoms of these plates vary. One bottom design is almost completely smooth and another design includes several "knife-like" edges ¾ in deep, perpendicular to the rail.

Ties are spaced approximately 21¼ in apart, with cinder ballast in spots. Most of the ties on curves are plated, but on tangents they may or may not be plated. No anchors are applied to the 75-lb rail but, downhill from this rail, heavier sections have 4 to 5 anchors per rail applied on the uphill sides of the ties. The grade is predominantly one direction, reaching a maximum of 1.35 per cent. Curvature is not excessive for branch operation.

Traffic is mostly coal, with the loads moving downgrade. As many as 60 to 70 loads are handled per train. Because of the lack of anchors, the excessive braking force exerted on the rail by trains often causes it to run.

Observation shows that the ties not plated are severely cut by the rail, whereas those equipped with plates are not. Also, the plates equipped with the "knife-like" edges split the tie's surface, whereas those with smooth bottoms have little effect on the wood surface.

None too small

By W. J. GILL
Roadmaster
Denver & Rio Grande Western
Denver, Colo.

Any tie plate is better than no plate at all on light-traffic lines.

Tie plates used on branches are usually salvaged from rail relays or track retirements and are of the largest size available. Some are repunched to accommodate the smaller rail sizes.

My experience has been that on lines where service is intermittent and traffic light, the 6-in by 8-in tie plate is satisfactory. It will protect the tie from mechanical damage for as long as the wood will resist decay.

On lines carrying heavier traffic, the plates should be at least 7½-in by 10-in. On sharp curves the 8-in by 11-in sizes should be used as the resultant reduced maintenance and longer tie life will more than offset the cost of the plates.

Extend 1½ in on each side

By THOR MONROD
Section Foreman (Ret.)
Northern Pacific
Billings, Mont.

Size of tie plates to be used on an light-traffic branch line is dependent upon several factors. One is the weight of the rail and the width of its base. Other factors include the ballast used, if any; the general surface and line of the track; the speed of trains; and traffic carried.

The smallest tie plate I have ever seen was on an unimportant branch line in Germany while I was with the U. S. Army railroad battalion.

NEW QUESTIONS to be answered in July

Do you have an answer to any of the questions listed below? If so, send it in. Payment — based upon substance and length — will be made for each published answer. If you wish your name withheld, we'll gladly comply.

DEADLINE: May 31

• 1. When programming undercutting or track-raising operations in the vicinity of bridges, what factors determine whether the structures should be raised, lowered or held at grade and still maintain a good grade line? Explain. How is this controlled in the field?

• 2. When steel spans must be raised four or five inches, what is the best way to do this? Explain. Should concrete blocks or steel shims be used? Why?

• 3. What factors determine the use of switch stands of the type which permits switches to be run through? Explain. Do such stands encourage switch crews to run through switches having conventional stands? Explain.

• 4. Some roads fireproof the decks of open-deck timber trestles by applying sheet metal. What are the advantages and disadvantages of this practice? Is the application of a bituminous coating with embedded screenings preferable? Explain.

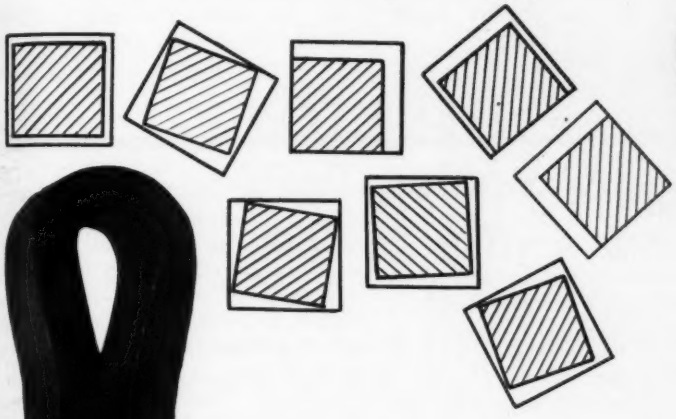
• 5. Since cranes of various capacities are sometimes used by field forces not entirely familiar with their capabilities, what measures should be taken to be sure that the machines are not overturned? Who is made responsible? Explain.

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

Troubled with loose fit of spikes in tie plate holes?... Plate cutting of ties ... wave in the rail ... Irregular gage?



TIE PLATE
LOCK SPIKE

The common ⅝" square shank cut spike may take any one of the various positions shown in cross-section at the line spike holes of the tie plate, which are scattered about this page. A reduction in size of the holes will not correct this trouble, as exhaustive tests of cut spikes in the smaller 11/16" square lag holes have proved.

Only LOCK SPIKES completely fill the holes by compression of the spread shank—firmly holding the plates to the ties under spring tension. Plate cutting is overcome—Rail is held to gage and line.

Rail Lock Spikes and Gage Lock Spikes are rail spikes as well as plate fastenings. Rail Lock Spikes also take up the play between the width of the rail base and the tie plate shoulders. The slight protrusion on the spike head at the tie plate surface binds against the edge of the rail base and forces the opposite shoulder into contact with the rail base. This action slightly skews the tie plates, as shown in the illustration below, and binds the rail at all four corners of the plate shoulders, as indicated by the arrows. Complete elimination of play in the spike holes of a tie plate and between the shoulders is accomplished.

GAGE
LOCK SPIKE

RAIL
LOCK SPIKE

BERNUTH, LEMBCKE CO., INC.
420 Lexington Avenue
New York 17, N. Y.

What's the answer? (cont'd)

This plate measured 5 in wide and 6 in. in length and ½ in thick. It was applied under a rail having a 4-in base width and had two spike holes. The plate had no shoulder on either side of the rail. Plates of this size were not very effective and they had sunk into the ties so far that the rail base was actually bearing on the tops of the ties. Also, the rails were tilted inward or outward causing bad line and gage.

In this country I have worked with the 6-in by 8-in, 2-spike hole, single-shoulder tie plate on branch lines laid with 56-lb, 66-lb and 72-lb rails, which have base widths 4 in up to 4¾ in, respectively. These plates have done a fair job.

I have also seen them used under 85-lb and 90-lb rails, with base widths up to 5 in, and I would say they were better than no plates. However, they are not as good as plates 7 in wide and 9 in long used under 85-lb, 90-lb and 100-lb rails with rail-base widths up to 5½ in. These plates have four spike holes and one shoulder.

It is my belief that plates should extend out at least 1½ in on each side of rail base to be better than no plates.

Equipment for field mechanics

Where field mechanics are assigned to tie-and-raising gangs, what basic tools and equipment should they have in their cars? Describe in detail. What other tools and equipment are desirable?

Hand and electric tools

By C. R. Turner
Supervisor of Work Equipment
Denver & Rio Grande Western
Denver, Colo.

The field repairman should familiarize himself with the type of equipment being used, to know what failures can be expected, and he should have the proper tools and parts to expedite such repairs.

He should have a complete set of mechanic's hand tools, i.e., end wrenches, box wrenches, socket wrenches and adjustable wrenches, as well as screw drivers, pliers, bars and punches. Special tools may be required on many of the later-type machines, such as gear pullers, special taps and dies, snap-ring extractors and gauges.

A small portable 110-volt ac generator is of considerable value when electric drills, impact wrenches, grinders and other electric tools are used.

A portable arc welder, as well as an acetylene torch, should be part of this regular equipment.

He should always carry such parts that are frequently needed, i.e., spark plugs, distributor points, chain repair links, assorted sizes of bolts, nuts and washers, insulated wire, terminals for lighting and ignition, material for gaskets, assortment of "0" rings for hydraulic systems, spare hydraulic pumps, relief valves, hydraulic hose and fittings, and a tank of nitrogen, as well as a set of gauges and adapters to be used when charging accumulators. Also, spare cable and clamps should be carried as well as tie-tamping bars, scarifier teeth, teeth for remover heads, jaws for tie renewers and spike pullers, as well as necessary welding rods and electrodes suitable for any emergency.

He should also be equipped with a portable hydraulic tester with various sizes of connections to make tests for pump and valve failures in the hydraulic systems.

He should have a ¾-ton pickup truck designed so as to make the various items easily accessible.

A complete list

By V. W. Oswalt
Superintendent, Maintenance Equipment
Central of Georgia
Macon, Ga.

Field or roadway mechanics assigned to tie and surfacing or raising gangs should be furnished with a ¾ or 1-ton highway truck with a telephone-type body, or a totally enclosed delivery-type body. This truck should be equipped with: Dual rear wheels, heavy-duty tires, four-speed transmission, heater and defroster, electric windshield wipers, booster brakes, West Coast-type rear-vision mirrors and ICC-code regulation lights.

To properly perform his assigned duties, a mechanic must have a complete set of good quality hand tools. Among these should be 12-point sockets ranging from ⅜-in drive up to and including ¾-in drive; the ⅜-in drive and ½-in drive sets to range in 1/16-in sizes and the ¾-in drive set to range in ⅛-in sizes. Another is a complete set of combination box end wrenches ranging in 1/16-in sizes from ⅜ in to ¾ in, and ranging in ⅛-in sizes from ⅞ in to 1½ in. Other essential tools include an ignition-wrench set; screw drivers of various sizes; an Allen wrench set, including ½-in, ¾-in and ⅞-in sizes; a punch set; a chisel set; pliers; grip vise; side cutters; needle point, diagonals, etc.; hammers, ¾ and 1½-lb; adjustable wrenches in 8-in, 10-in and 12-in sizes; and pipe wrenches in 10-in, 14-in and 18-in sizes.

His equipment should include: A hand tachometer reading from zero to 400 rpm; a timing light for checking gasoline engines; a compression gauge for checking all types of internal combustion engines; two drill motors, one ¼ in and one ½ in; a 6-in electric grinder; a 10-ton hydraulic jack; a 15-ton hydraulic press unit; a complete set of 12-ft battery jumper leads; a battery hydrometer; an anti-freeze hydrometer; and a heavy-duty 4-in combination vise.

Other equipment would include: A 200-amp dc welding machine, gasoline-engine driven, with two 1500-watt ac outlets (The dc welding machine is used, in addition to welding, for charging batteries and pre-energizing permanent magnet generators. The ac side is used to drive drill motors, grinders and furnish lights); a welding helmet; dark goggles; welding gloves; 75 ft of welding leads with rod holder, wire brush, scaling hammer and both mild and hard surface 5/32-in welding rods; one tank of oxygen and one tank of acetylene with 50 ft of hose for each of the tanks; combination cutting and heating torch along with proper size tips; and a small quantity of bronze and iron rods

PLASSERMATIC VKR-04 PX 10

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1957-1959 developed
1960 put into operation
1961 already a world-wide concept

This machine is being described by Permanent Way experts as the greatest progress in the past 20 years in the field of railway machinery.

The performance of the machine is its best recommendation, the number of machines sold is the best recommendation for us.

20 **Machines were bought by the British Railways**

21 **Machines were sold to Western Germany**

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Austria
Australia
Canada
France
Italy
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Tunisia
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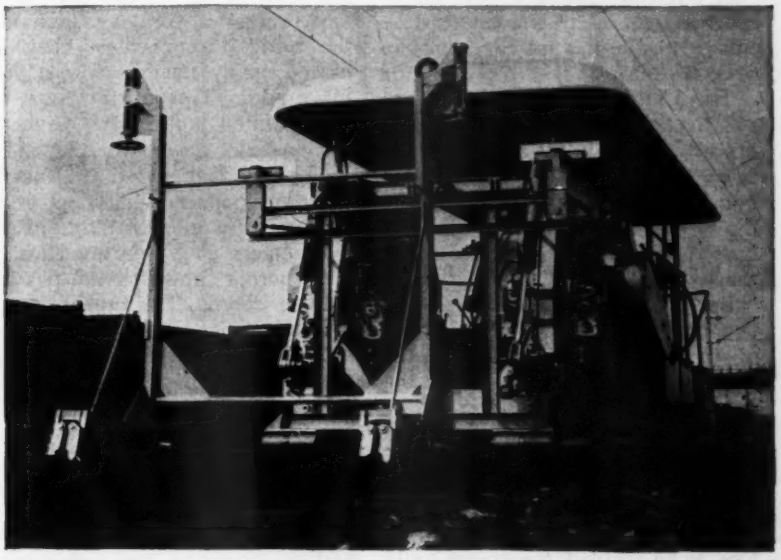

16 men and 50 track jacks for the advance work or 2 lifting machines in front of a normal tamping machine can be saved.

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Canada

with proper flux for gas welding.

In addition to the above tools, a certain amount of small parts used frequently by the mechanic should be stocked in his truck. These would include: Spark plugs, distributor points, carburetor kits, "O" rings, seals, hydraulic cylinder-packing piston rings, air-cylinder packing and piston cups, etc. This material is governed by the types and number of machines which the mechanic maintains and protects. A quantity of bolts, nuts and washers of various sizes in both national fine and national coarse should be carried in partition trays for ready use. Some copper tubing and flexible fuel lines, along with proper cutting and flaring tools should also be carried along with an assortment of tubing fittings and Alemite fittings.

A suitable-size fire extinguisher, preferably a dry-chemical type, must be installed on the truck in a convenient location. A weatherproof locker for wearing apparel and parts and instruction books should also be provided.

Each piece of equipment assigned to the gang should carry all special tools characteristic to that individual machine. These tools, and possibly a few special parts, are the responsibility of the machine operator. Should the operator of the machine leave it for another assignment, he should turn all tools and parts over to the supervisor in charge of the gang. The supervisor in turn will assign the tools and parts to the next operator of the machine.

The loss of valuable tools and parts can become expensive, therefore, a close check must be kept and only responsible personnel should have access to same.

Economical pile-driving sequence

When replacing bents in timber bridges, what is the best and most economical sequence of driving the piles? Why? (In answering this question, refer to pile No. 1 as the one on the extreme left and to pile No. 5 or 6, as the case may be, on the extreme right as you face the direction of increasing bent numbers.)

Make two passes

By R. Huco
Bridge Engineer
Canadian National
Winnipeg, Man.

It is assumed that this refers to redriving or rebuilding an existing timber trestle, this usually being an open-deck trestle.

The Canadian National standard pile trestle has four chords of stringers with two 8-in by 16-in stringers in each chord. Ties are spaced with 6-in by 8-in timbers drapped over the ties, and trestles over 50 ft long have steel guard rails between the track rails.

Bents are about 12-ft centers with five piles per bent up to a height of 16 ft, and six piles for higher bents. Above a height of 7 ft the outer piles are battered.

The first step in driving new bents in a trestle is to locate them in the most suitable position. There have usually been one or two previous rebuildings, and old pile locations have to be avoided. New bents could be spaced as close as one foot clear of existing bents when steam hammers are used to drive the piles, but some diesel hammers are offset in the leads and new bents have to be further than 2 ft away from existing bents. The other controlling factor in bent location is to avoid exceeding the standard bent spacing, which means that some short openings have to be introduced.

Piles for the new structure are unloaded at the bridge site, or, in long bridges, at various places along the bridge, from where they are picked up by the pile-driving crew for driving. Tips of piles are seldom pointed unless hard driving is anticipated.

The deck is prepared by removing the timber spacers and steel guard rail and also all fastenings of ties to stringers or blocks on caps, so as to permit spreading the ties and stringer chords. Ties are opened at bent locations and chords are shifted sideways from end to end of the trestle so as to allow driving the same piles in each bent along the length of the trestle in one pass of the pile driver. In five-pile bents, piles 1, 3 and 5 would be driven on the first pass down the bridge, then the chords shifted over and piles 2 and 4 driven on the return pass. Six-pile bents require three passes, with piles 1 and 6 driven on one pass, piles 2 and 5 on another, and 3 and 4 on the third pass.

Piles are ordered in sufficient length so that they do not have to be driven below top of ties to obtain satisfactory penetration. One reason is that larger openings would be required in the deck if the hammer had to pass through, especially if a diesel hammer is used. A second advantage is that if there is any damage or splintering in the upper end of the pile, this is cut off and sound piling remains in the finished bent.

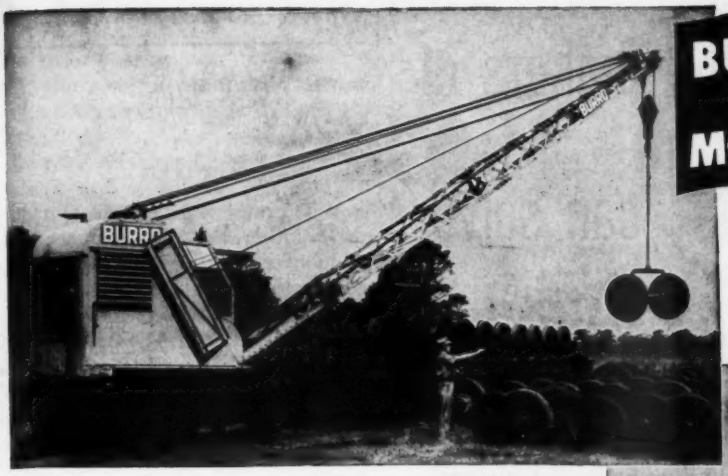
This means two cuts to each pile, but is not much of a problem with chain saws. The pile driving crew makes the first rough cut below stringers so that stringer chords may be shifted and deck openings closed.

The B&B crew comes along later and makes the precise pile cut-offs when it places the caps. Pile tops are treated before capping.

If a grade raise is required, the deck is shimmed up on the existing caps or a double cap is placed. Other variations to the standard procedure may be required to suit special conditions. On heavy curvature, for instance, the low rail may have to be raised so that the pile driver will not be tilted so much that it cannot drive the outside batter piles of the trestle.

What has been said is mainly applicable to open-deck trestles. We began building ballast-deck trestles about 1930, and not enough of these have been redriven to date to establish any special procedure. In the few on which pile replacement has been necessary, the ballast and floor plank are completely removed, the track is blocked up temporarily, and then redriving proceeds as for an open deck trestle.

(*Please turn to page 50*)



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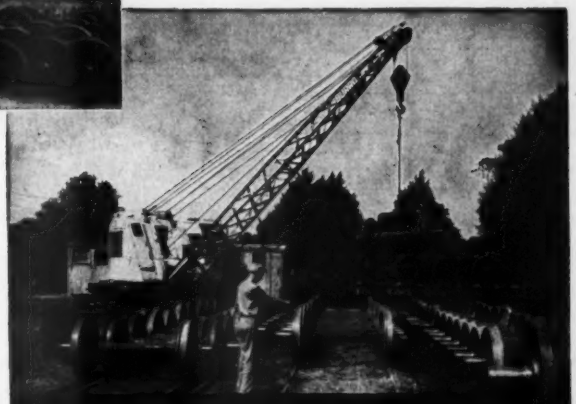
Unloading car wheels with a Burro. The Burro moved the flat car into position and will haul it away when wheels are unloaded.



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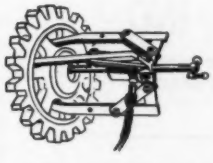

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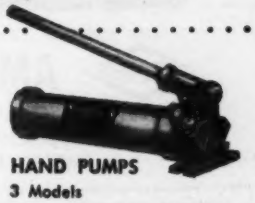

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What's the answer? (cont'd)

Batter piles first

By A. W. HODGSON
Chief Carpenter
Milwaukee Road
Deer Lodge, Mont.

When renewing bents in a bridge, drive either the piles No. 1 or 5, whichever the case may be, backing across the bridge. The chord can then be shifted to permit driving either piles 2 or 4 as the driver backs up. Then, while pile 3 (or the plumb piles) is being driven, the chords can be moved back into place and anchored.

Doesn't stop pile driver

By P. E. DUFFY
Supervisor Bridge & Building
Great Northern
Minneapolis, Minn.

I think we have all seen jobs where there was a tendency to establish a big day's driving record by starting out either with the outer or the center rows of piling. The reason for this was that they are readily accessible without too much tearing up of the deck. In fact, with six-pile bents, the outside batter piles could be driven at once merely by shifting the ties a bit. The center pile also is very accessible.

The one bad feature of this practice is that, when the outside rows are driven first and followed by the center row, the two or three remaining piling in the bent do not have the same penetration in some soils as the piling previously driven. This is because the ground is impacted between the piling. Later on this ground becomes saturated from rains or overflow from streams and softens, allowing the last-driven piles to settle a bit, sometimes several years later.

We have had considerable success in using a small hydraulic jack to shift the deck behind the driver. We start our pile-driving operations by driving the No. 1 piling of each bent right across the length of the bridge, starting with No. 1 bent and backing away from the work. As soon as the driver has worked three or four bents away, our hydraulic jack is placed on top of the cap outside the chord, where it is chained around the cap and second piling. The jack is then used to move

the chord inward at each bent.

This work follows closely behind the driver. When row No. 1 is driven, the pile driver moves over to piling No. 2 starting with bent No. 1, and drives that row of piles. By the time the driver has reached the center of the bridge, the work of jacking the chord over is finished (depending, of course, on the length of the bridge). The chord is then jacked back into place or a little bit beyond it's original location so that pile No. 3 may be driven.

While the pile driver is driving either the center pile or piling No. 3, the other chord is moved outward, with the hydraulic jack placed between the chords. By the time the center row of piles is driven, chord No. 2 has been jacked inward so that No. 4 pile can be driven. The same procedure is followed for the remainder of the driving. This way the deck is always ready for the driver to start another row, with the piles being driven in the sequence of 1, 2, 3, 4, 5 and 6, if six-pile bents are involved.

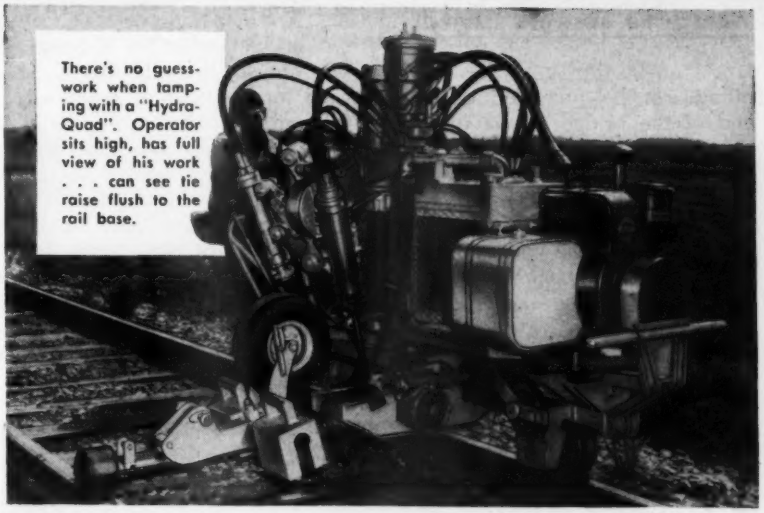
Another advantage of this method is that, after the first two rows of piling are driven, the man on the ground who is alining the piles has a better opportunity to accurately spot each pile, as he does not have to look around at previously driven piling of an outer row. We are able to get very uniform looking bents as a result of this method, with less bending of piling required. Also, the above-mentioned method does not tie up the driver by using it for shifting the deck or in waiting for the crew to jack the deck mechanically.

Drive rows 1, 5, 3, 2 and 4

By C. E. WACHTER
B&B Master
Canadian National
Port Arthur, Ont.

Various systems of redriving pile structures have been used but in my opinion the best, and most economical sequence of pile driving is as follows (based on five-pile bents, although six and seven-pile bents are handled in a similar manner):

If the piles arrive with the pile driver, the foreman in charge will pick out a location for unloading them at the end of the bridge where a fairly level area is available. The



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piling can be unloaded at either end of the bridge if pile driver is the type of machine that can be fully rotated. If pile driver is the type which can be used in one direction only, then the piling must be unloaded at the end opposite to that which the machine is facing.

After the piling have been unloaded, two men are assigned to the job of preparing them for driving. The remainder of the men get the bridge ready for driving. The pile line on the pile driver can be used for assisting in practically all this work. Spacer timbers and the steel guard rail are removed from the bridge. Also, one tie is removed where each new bent is to be driven.

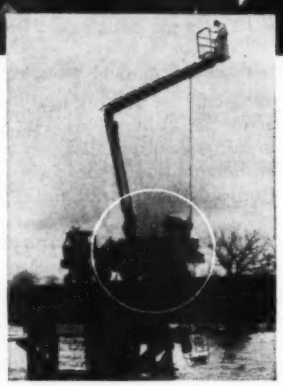
All outside piles No. 1, or the No. 5 row of piles, are driven first. If all the No. 1 piles are driven first then the No. 5 piles of all bents are driven next. It is assumed that all pile locations have been staked previously to the arrival of the pile-driving gang. The reason for driving the entire row of No. 1 piles first is for speed and economy. The pile driver leads are tilted for the desired batter and the driving is started at the opposite end of the bridge to where piling has been unloaded. If it is not possible to drive a pile down sufficiently to clear traffic, this pile is cut off while the machine is backing up to pick up the next pile.

The process is repeated until the driving of the No. 1 line of piling is completed. The batter of the leads remains the same and no time is lost. When the No. 1 line of piling has been driven, the process is repeated with the No. 5 line of piles. It is preferable to drive the No. 3 line of piles next and then the No. 2 and No. 4 lines of piling. It is not important as to the sequence of driving the No. 2 and No. 4 lines of piles – either can be driven first – whichever works out to the best advantage.

The idea of driving the outside batter piles first is that it is far easier to get a good line in each individual bent. If either the No. 1 or No. 5 piles pull away from the location stake, the No. 3 and subsequent No. 2 and No. 4 piles can be lined by the man spotting the piles. By using this sequence, a completed bent is in good line and it is far more economical to install the braces on a well-lined bent than it is when the piles are out of line.

When the new bridge is to be longer than the old bridge and either or both of the new dump bents are outside the ends of the old bridge, these bents (in entirety) are driven after all other piles in the bridges have been driven. The sequence of driving these dump bents is the same as outlined above. Piles No. 1, then No. 5, followed by No. 3, and then No. 2 and No. 4.

Bents outside the old bridge are driven last because that ground is compacted and exerts pressure on the dump walls. In some cases this exerts pressure against the ends of the stringers and makes it difficult to move them. It is nearly always necessary to move lines of stringers when piles are driven in an old bridge. If new dump bents outside of an old bridge were driven before the piles in the bridge were driven, extra work would be created in moving the stringers.



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A seven-man crew, excluding the foreman and pile-driver operator, can perform pile driving efficiently and economically by the method outlined above. Work assignments are: Two men sharpening and putting pile line on piles; a signal man on leads of pile driver; a man on deck for deck spotting; two men to cut off piles and move braces as required for driving; and one man on the ground to spot the piles.

When to renew joint bars

What factors determine when joint bars should be renewed out of face? Explain. What instruments or tools are necessary for conducting a joint-bar inspection for this purpose?

No simple rule

By W. E. CORNELL
Engineer of Track
New York, Chicago & St. Louis
Cleveland, Ohio

There are several points of wear and deterioration that contribute to an unsatisfactory joint condition and many of these would not be corrected by the installation of new bars. There is rail-end batter, the most common and readily observed, and wear on the contact surfaces of both the bars and the rail. I doubt if bent bars are as great a factor as it is sometimes believed.

It is difficult to evaluate the bar and rail-end wear separately. Bent bars are not frequently found where there is reasonably well-maintained surface and bolt condition of 110-lb rail and heavier. If bent bars do exist, I am sure that excessive rail-end batter, wear and poor surface have been the cause.

I doubt if there is any simple rule by which one might determine when bars should be renewed. The wear on the bars and rail is frequently not the same within a territory. I have observed joints where the base of rail was worn to a depth of 1/16 in and more at the contact area at one end of the bar with no visible wear at the other end.

To properly inspect for possible bar renewal, I feel it is necessary to

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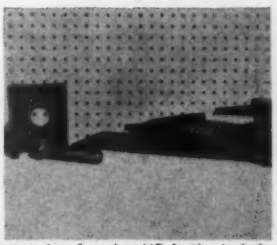
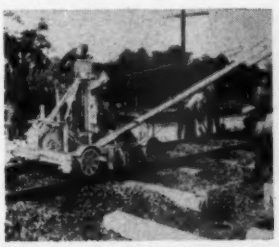


Accessories for the MR-1 tie include bolt, clip, threaded insert, tie plate and pad.



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What's the answer? (cont'd)

visually inspect the joint as a whole and also to remove a number of bars for detail inspection with a straight edge and gage for determining wear and batter. It is my opinion that, if rail-end wear is not carefully considered, we may find that new bars have provided only about 50 per cent of the desired correction and that this correction will last for considerably less time than may normally be expected from new bars.

Severe wear

By J. H. BECKER
Section Foreman (Ret.)
St. Louis-San Francisco
Festus, Mo.

There are several reasons why I think angle bars should be changed out-of-face. You will often find that the oblong holes of the bars are badly worn so that the shoulders of the bolts will not hold. This condition makes it impossible to tighten the bolts securely and is itself the result of improper bolt maintenance.

Bolts should be tightened in April and October. This will produce much better results. If bolts are allowed to get loose, the bars will wear under the hammering of traffic so that there will be some play between the angle bar and the rail. Then they will never stay tight. About the only thing left to do is to build up the angle bar. If this is not done, you will have a lot of joints hammering and swinging. The final result will be a lot of battered rail ends which can never be kept up.

Properly seating bridge shoes

What are the best methods for obtaining full bearing under bridge shoes or new bridge seats? On worn bridge seats? Explain.

Uses pads

By A. B. WANG
Bridge & Building Supervisor
Monon
Lafayette, Ind.

On new construction, even though care is taken in leveling a bridge seat, it is best to use a composition pad to secure full bearing. For short spans, pads should be at least ½ in thick, but more thickness should be used for longer spans. Pads can be ordered pre-cut to allow some projection beyond bearing plate or shoe, with holes cut out to fit the anchor bolts. These pads should be put on the bridge seat over the anchor bolts before setting the steel.

On old bridge seats where the coping has worn out, the coping should be removed and grillage put in its place. The shoes should bear directly on the grillage. After installing new anchor bolts, the grillage can then be encased.

Where the coping is still serviceable but the shoes are out of level, the shoes should be leveled with iron rust.

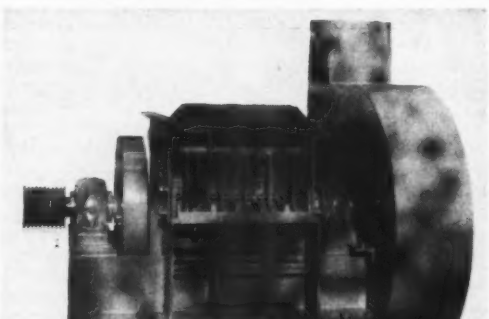
Where the shoes have made a slight indentation in the masonry, they should be raised enough to slip in sections of composition pads between the anchor bolts. Heavy belting can be used where composition pads are not available.

Use non-shrink mortar

By MASONRY INSPECTOR

The best method, of course, to obtain full bearing of bridge shoes on new bridge seats would be to make sure that the bridge seat is at the proper grade and is given a troweled finish. If depressions or irregularities develop in the shoe area of the bridge seat, it may be necessary to bush hammer or grind it to remove them. Then, one of the following two methods may be used to obtain full bearing under the shoes:

(1) Use layers of canvas and red lead. I recommend using 1-ply of canvas painted on each side with red lead. In any case, not more than three plies of canvas should be used. The canvas should be cut



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122. Model WB-2-F Snoweeder – Designed for use both as a weed burner and a snow melter in yards and at switches. (Page 43)

123. Lock Spikes – Different versions are offered for use as hold-down spikes and as rail and gage spikes. (Page 45)

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128. MR-1 Concrete Tie – With new mass production machine these ties can be produced at rate of 30 sec per tie. (Page 53)

129. Machine for Grinding Up Ties – Unit mounted on small car grinds up ties and blows chips on the ground. (Page 54)

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138. Rail Grinding Service – Contract arrangement obviates need for capital investment by railroad. (Page 61)

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Items described in Product Section

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154. Model 1FU-D Undercutter-Skeletonizer – Has hydraulically driven chain for extruding ballast from beneath track. (Page 42)

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155. Weed and Brush Killers – New booklet is offered by Du Pont on its line of herbicides. (Page 39)

156. Brush Control – Brochure on Weedone brush killers offered by Amchem Products. (Page 50)

157. "Hydra-Quad" Tamper – Racine Hydraulics will send literature on this one-rail tamper. Also on its "Oct-A-Gun" gang tamper (No. 158 on card), rail saw (No. 159), anchor applicator (No. 160), unit tamper (No. 161), and rail drill (No. 162). (Page 51)

163. Ka-Mo Air Drills – Bulletins available on line of drills for finding trouble spots, and drilling for drains, cast-in-place piling. Also hydraulic drills (No. 164 on card), gasoline (No. 165) and electric (166). (Page 57)

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to match the bottom of the shoe and anchor bolts.

(2) Use a non-shrink aggregate and cement mixed in the ratio of 1:1 to the consistency of thick cream. This mixture should be spread about ⅛ in deep over the shoe bearing area to fill depressions or irregularities, then the shoe should be placed. Any of the mixture squeezed out from under the shoe should be cleaned away.

On an old bridge seat, I recommend using method No. 2 mentioned above, unless it is necessary to raise the shoe out of a depression in the bridge seat. If the shoe has to be built up 1 to 3 in, the best method is with a rammed-in-place, non-shrink aggregate mortar of a dry consistency. The mix should be one part non-shrink aggregate to one part cement to 1½ parts torpedo sand.

The shoe should be wedged up ⅛ in above final grade. The area under the shoe should have all deteriorated material removed, and be thoroughly cleaned and wetted. A board should be placed at the opposite end from the work area to retain the mortar. Ramming boards should be 2 to 3 in wide, about ½ in less than the height of the area to be filled, and long enough to reach the retainer board at the opposite end of the shoe. The mortar should be rammed in place with care, so that the entire area under the shoe is filled with compacted mortar.

Immediately after the mortar has been placed, the wedges should be removed and the dead load placed on the shoe and bearing area. If the work is being done between train movements, an accelerated-set-type non-shrink mixture must be used.

No problem

By E. F. Bateman
B&B Supervisor
Union Pacific
Salt Lake City, Utah

From my experience as a B&B supervisor this does not seem to be much of a problem. When concrete becomes worn under a shoe we level up the spot with rust joint. This has proven most satisfactory.

I have no difficulty on new bridge seats as a good, even surface is made on concrete at the time it is poured.

The installation of tie pads has helped the situation as there is less vibration. We now have tie pads on all main-line bridges on the Utah division of the Union Pacific, and we now are in the process of installing "abrasion pads." This will also lessen the vibration.

I believe tie pads to be the answer.

Several methods used

By E. B. Jones
Supervisor Bridge Erection
Chesapeake & Ohio
Huntington, W. Va.

There are a number of ways to obtain full bearing on new bridge seats, three of which I will mention:

(1) Set bridge shoe on ½-in reinforced rubberized pad. The elasticity of the pad allows high places of the bridge seat to recess into the pad and the low places to fill by the pressure on pad. This pad also acts to prevent any scouring of the masonry by the bridge shoes, thus preventing future maintenance. Another factor is the labor saving involved in applying the pad. There is no delay to traffic, as the bridge is ready for use when lowered into position. Anchor bolt holes in pads are prebored.

(2) Set bridge shoes on cement grout, to which an admixture has been added to prevent shrinkage. This will give fairly even loading on bridge shoes, but will not prevent the scouring action of bridge shoes on the masonry.

(3) Pour concrete bridge seat ¼ in high and bush it down to grade. Then rub it with an emery stone to a true surface. This method is the most costly due to labor involved.

On worn bridge seats there are also a number of ways to obtain full bearing under bridge shoes:

(1) If the condition of the bridge seat is such that it will be necessary to remove it, a precast block may be used or a new bridge seat poured in place. The installation of the precast block will require less falsework than where the entire bridge seat is poured in place. In both of these instances, however, I would recommend using the ½-in reinforced rubberized pad between the masonry and bridge shoe.

(2) Jack bridge to proper elevation and block same so as to carry the load, then remove approximately one foot of the old bridge seat under the bridge shoe and replace it with shotcrete. The masonry to be removed should be in a triangular shape which will leave one side open to give a pocket to start placing the shotcrete.

After the masonry is removed, install the necessary dowels for anchoring the new material. The area should be reinforced with ¼-in by 6-in by 6-in welded wire mesh. Before placing the shotcrete, be sure to remove all deteriorated concrete and flush out area with clean water to get rid of all dust and make the shotcrete bond to the old masonry. The shotcrete is placed by starting in the triangle and building out solid and against the bridge shoe to the face of the bridge seat. Strike off excess shotcrete to conform with old masonry. It will be necessary to allow shotcrete to cure sufficiently before placing load on it.

(3) For a fast and economical method of obtaining equal bearing on old bridge seats, jack up bridge to the proper height, then clean the recessed or worn place in the bridge seat and fill with a material composed of ground iron and a chemical admixture (rust joint iron). Tamp and level it with the original bridge seat. Then place a 1-in plate, which should be at least 2 in larger than the bridge shoe, so as to hold the material in place and exclude moisture. The bridge can be immediately lowered onto the plates and traffic resumed. This method is for bridge seats where anchor bolts can be extracted or where it is possible to cut the 1-in plate in two pieces and fit around the anchor bolt.

For bridge seats where the anchor bolts cannot be removed, raise the bridge shoes ½ to 1 in higher than the original bridge seat. Then, by using a blunt rod, start packing the exposed area with rust joint iron which has been mixed with as little water as possible. Begin at back of bridge shoe and work to the outside. Be sure that the entire area under the shoe is packed. You can now remove the jacks and restore traffic. Excess material is then removed from the bridge seats and the exposed edges around the bridge shoes are sealed with a heavy coating of asphalt to exclude moisture.

To the editor

Tells how to measure maintenance efficiency

Albany, N. Y.

TO THE EDITOR:

I have read with interest the editorial "M/W efficiency – Can it be measured?" that appeared on the Opinion page of your February 1961 issue.

You make the statement with regard to the M/W ratio: "Its usefulness is limited to situations where highly similar conditions of traffic and tonnage prevail." While I agree that traffic and tonnage are significant today, I don't think they are sufficiently so to warrant the "highly similar" qualification. Modern materials and equipment and modern methods of utilization have, in my mind, lessened the significance of these two factors appreciably.

I think that a more significant qualification would be "to situations where a highly similar quality of physical condition is maintained." It is obvious that a low M/W ratio can be achieved by performing no maintenance whatsoever.

With regard to the measure of M/W efficiency, I can't quite agree that it is not measurable. I would be the first to admit that it cannot be measured with exact science, nor can many phases of it be measured currently with any degree of significance. However, a management with an "open mind," which you prescribe, can obtain a sufficiently accurate appraisal of its M/W efficiency, in the recent past, to compare it to that of other roads and decide whether or not its ratio is "in line" and whether or not its M/W organization is performing as well as its neighbors.

This requires visits to other roads to observe the general level of maintenance. It requires some general knowledge of traffic and tonnage conditions, of physical facilities, and of the territories and physical characteristics of the various properties to be measured. This doesn't necessarily involve a dedication to travel on foreign lines; it just means getting off the "soft cushion" once in a while to take a look at the other fellow's bailiwick.

Having a very general knowledge of the other road's peculiarities, the analyst can discount them and make his comparisons of the individual fields of M/W activity on his road with those of another on a more or less equal basis. Here, I wish to stress that, except in isolated cases, these peculiarities are not as significant as they appear at first glance.

For instance, it is quite easy to make a comparison with regard to Supervision (ICC Account 202) after giving weight to mileage, significant peculiarities of service and the size of the M/W expenditure.

Likewise, Track Laying and Surfacing (ICC Account 220) should not be difficult of analysis when consideration is given, among other factors, to the amount of rail laid, the quantity of ballast used and the number of ties installed.

Charges to Account 269 – Roadway Machines – on one road can be compared with those on another if weight is given to the investment in roadway machines

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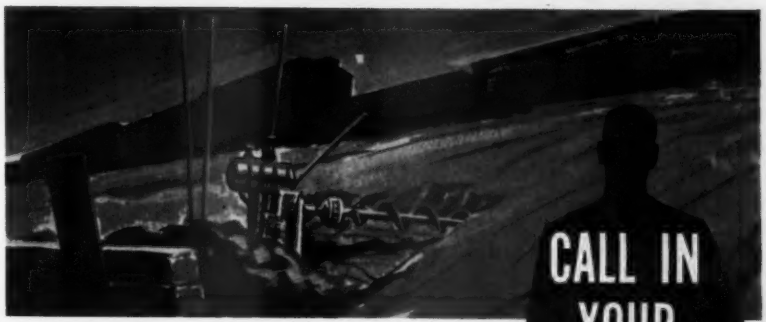

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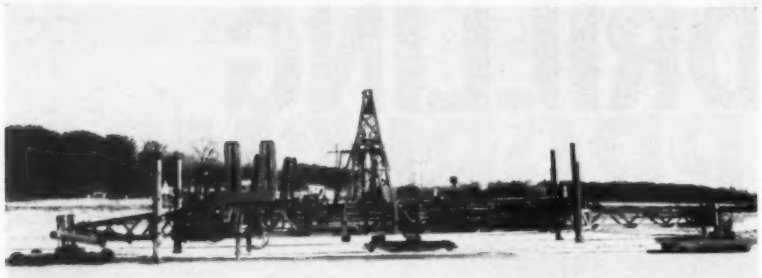

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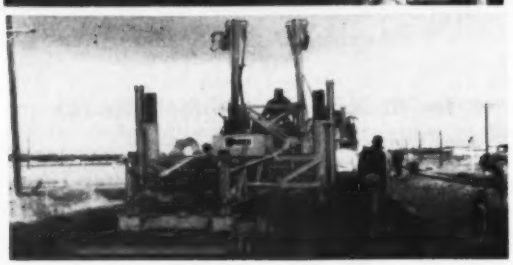

Aligning unit keeps track in alignment behind both Plow and Sled. Worn ties are knocked off by hydraulic hammers, ejected to one side automatically.

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To the editor (cont'd)

and utilization of them as evidenced by the charges to Account 220 – Track Laying and Surfacing, Account 214 – Rails, Account 212 – Ties, etc.

It would not be difficult to show how a significant comparison could be obtained with regard to charges to other accounts on one road as compared to those of another. To do this might require consultation with the other road to reconcile some inconsistencies. This is beneficial because it gives the analyst an even better insight into the efficiency factors of the respective properties.

In short, I think that M/W efficiency in the recent past is measurable to a degree sufficiently significant to give management a basis for fairly accurate comparison. I feel that M/W people are, and have been, too prone to consider too many aspects of their work as not being adaptable to exact scheduling, scientific methods, or significant evaluation. I believe you can well remember when production-line methods, "cycle" maintenance and precision programming were first proposed. The prevalent attitude was one of derision, disbelief and disinterest. Today, these terms are indispensable in the M/W vocabulary.

I submit that every aspect of railroading, especially of the M/W portion of it, is adaptable to a scientific approach if one is seriously interested in finding it.

J. P. Hiltz, Jr.
Vice President
Operation and Maintenance
Delaware & Hudson

Says publicity on NRAA exhibition was appreciated

Chicago, Ill.

To the Editor:

The fine publicity that appeared in your publication prior to and during our exhibit was greatly appreciated by the officers, directors and all of our exhibitors.

The large attendance was most gratifying and we want you to know we appreciate your cooperation.

Kenneth Cavins
President
National Railway
Appliances Association

Association news

Mississippi Valley Maintenance of Way Club

At the April meeting of the club, to be held on the 10th, L. B. Yarbrough, superintendent signals and communications, Wabash, will talk and show colored slides on "Russia's Railroads."

The next meeting will be held on May 8 and will include election of officers for 1961-62. Designated as presidents' night, the meeting will have as its principal speaker R. K. Heineman, president of the Alton & Southern, who will speak on maintenance of way.

Both meetings will be held at the usual

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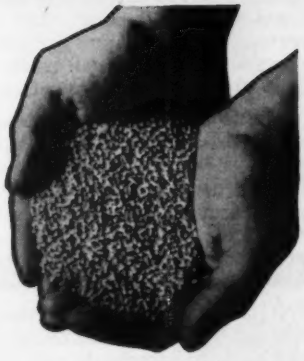

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Association news (cont'd)

location, the Ambassador-Kingsway Hotel, 108 North Kingshighway, St. Louis, Mo. The social hour will commence at 5:30 pm, with dinner starting at 6:30.

National Railway Appliances Association

The annual meeting of the NRAA was held on Wednesday, March 8, at McCormick Place, Chicago, during the exhibition sponsored by the association in connection with the AREA convention. In the election of officers J. P. Kleinkort, vice president (Railroad Products Division, American Brake Shoe Company), was advanced to president; G. R. Betts, treasurer (Armco Drainage & Metal Products, Inc.), was promoted to vice president; R. B. Little, secretary (Reliance Division, Eaton Manufacturing Company), was moved up to treasurer; and Thomas Y. Gehr, a director (Matisa Equipment Corporation), was elected secretary. C. J. Miller (The P&M Co.) was re-elected a director for three years, and J. P. Bowers (O. F. Jordan Company) was elected a director to serve for three years.

Association of Track and Structure Suppliers

A meeting of the board of directors of the AT&SS was held at the Union League Club, Chicago, on March 10, with President Ray T. Johnson, Jr., presiding. Preliminary plans were discussed for the annual banquet and other activities to be sponsored by the AT&SS during the 1961 annual meetings of the Roadmasters' Association and the American Railway Bridge & Building Association. These meetings will be held at the Conrad Hilton Hotel, Chicago, September 18-20. The next products exhibition of the AT&SS will be held in September 1962 in conjunction with the annual meetings of the Roadmasters' and B&B Associations.

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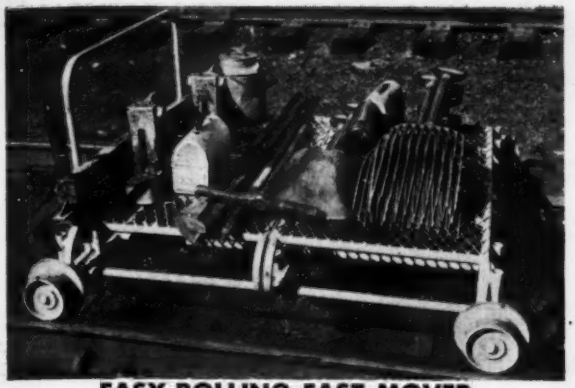

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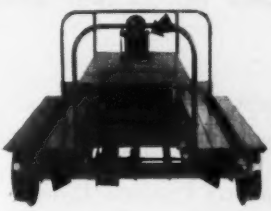

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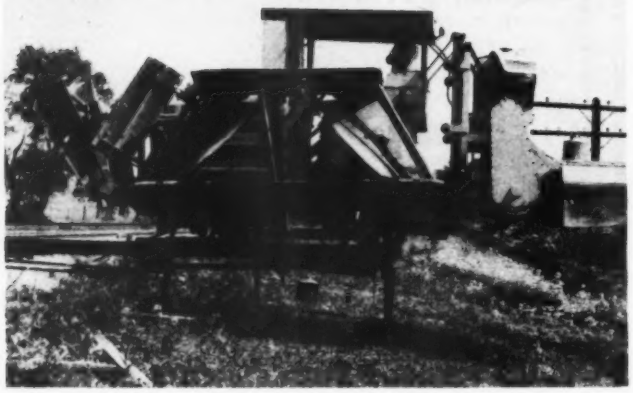

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A COMPLETE LINE OF RAILWAY SPRING WASHERS

The NATIONAL LOCK WASHER COMPANY

Serving Industry Since 1886 — NEWARK 5, NEW JERSEY, U.S.A.

NEW NORDBERG "Switchliner" makes quick work of LINING TURNOUTS

▲ Position of Switchliners depends upon how much track must be moved.

▼ Trakliner with "A" frame shown in raised position as normally used in lining open track.

Here's the latest Nordberg "Mechanical Muscle" to increase efficiency and lower costs on track lining operations . . . the new "Switchliner," a versatile "power assist" that makes quick work of lining turnouts and crossovers in either tangents or curves.

These new Switchliners, normally used in teams of four units, are accessories which are powered by the hydraulic system of any Nordberg Trakliner. Lining a turnout with the Switchliner is accomplished by placing them in the cribs under the rails. When lining at points where it is difficult to move the turnout, such as at the heel of a frog, all four Switchliners may be used to shift the track. At other spots, two may be sufficient.

Why not call or write today for further details, or to find out when these units will be working in your area.

NORDBERG MANUFACTURING COMPANY, Milwaukee 1, Wis.

Write For LEASING Plans

NORDBERG *Mechanical Muscles*®

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